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1/46

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JAN 18 2002
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SEQUENCE LISTING

<110> Abbott Laboratories
Mukerji, Pradip /
Das, Tapas
Huang, Yung-Sheng
Parker-Barnes, Jennifer M.
Leonard, Amanda Eun-Yeong
Thurmond, Jennifer M.

<120> ELONGASE GENES AND USES THEREOF

<130> 6407.US.P2

<140> 09/624,670

<141> 2000-07-24

<150> US 09/379,095

<151> 1999-08-23

<150> US 09/145,828

<151> 1998-09-02

<160> 87

<170> FastSEQ for Windows Version 4.0

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<212> DNA

<213> Mortierella alpina

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<212> DNA

<213> Homo sapiens

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<211> 867

<212> DNA

<213> Caenorhabditis elegans

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ggaaccattg	ccaacaaagg	aattgtcgca	tcctactgca	aagtgtttga	tttcacgaaa	360
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accatcttct	tggttctccg	taaacgtcca	ctcatgttcc	ttcactggta	tcaccatatt	480
ctcaccatga	tctacgcctg	gtactctcat	ccattgaccc	caggattcaa	cagatacgga	540
atlttatctta	actttgtcgt	ccacgccttc	atgtactctt	actacttctt	tcgctcgatg	600

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<210> 5

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<212> DNA

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<213> Jojoba KCS

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      20           25           30
Pro Leu Leu Gly Leu Ala Ser Ala His Leu Ser Ser Phe Ser Ala His
      35           40           45
Asp Leu Ser Leu Leu Phe Asp Leu Leu Arg Arg Asn Leu Leu Pro Val
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Val Val Cys Ser Phe Leu Phe Val Leu Leu Ala Thr Leu His Phe Leu
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Thr Arg Pro

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 <213> *Saccharomyces cerevisiae*

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Asn Gly Leu Phe Gln Leu His Asn Leu Val Leu Thr Ser Leu Ser Leu
      35           40           45
Thr Leu Leu Leu Leu Met Val Glu Gln Leu Val Pro Ile Ile Val Gln
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His Gly Leu Tyr Phe Ala Ile Cys Asn Ile Gly Ala Trp Thr Gln Pro
      65           70           75           80

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ctcgtctctca cctccctctc cctcaccctc ctctctctca tgggtogagca gctcgtcccc    180
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<210> 11
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 <213> *Mortierella alpina*

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 <213> *Saccharomyces cerevisiae*

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<211> 345

<212> PRT

<213> Saccharomyces cerevisiae

<400> 14

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65					70					75				80	
Ile	Val	Tyr	Tyr	Ile	Ile	Ile	Phe	Gly	Gly	Gln	Ala	Ile	Leu	Arg	Ala

				85				90					95		
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Ser	Lys	Glu	Ala	Phe	Ala	Pro	Lys	Leu	Val	Thr	Leu	Tyr	Tyr	Leu	Asn
145					150					155					160
Tyr	Leu	Thr	Lys	Phe	Val	Glu	Leu	Ile	Asp	Thr	Val	Phe	Leu	Val	Leu
				165					170					175	
Arg	Arg	Lys	Lys	Leu	Leu	Phe	Leu	His	Thr	Tyr	His	His	Gly	Ala	Thr
			180					185					190		
Ala	Leu	Leu	Cys	Tyr	Thr	Gln	Leu	Ile	Gly	Arg	Thr	Ser	Val	Glu	Trp
		195				200					205				
Val	Val	Ile	Leu	Leu	Asn	Leu	Gly	Val	His	Val	Ile	Met	Tyr	Trp	Tyr
		210			215					220					
Tyr	Phe	Leu	Ser	Ser	Cys	Gly	Ile	Arg	Val	Trp	Trp	Lys	Gln	Trp	Val
225					230					235					240
Thr	Arg	Phe	Gln	Ile	Ile	Gln	Phe	Leu	Ile	Asp	Leu	Val	Phe	Val	Tyr
			245						250					255	
Phe	Ala	Thr	Tyr	Thr	Phe	Tyr	Ala	His	Lys	Tyr	Leu	Asp	Gly	Ile	Leu
		260					265					270			
Pro	Asn	Lys	Gly	Thr	Cys	Tyr	Gly	Thr	Gln	Ala	Ala	Ala	Ala	Tyr	Gly
		275					280				285				
Tyr	Leu	Ile	Leu	Thr	Ser	Tyr	Leu	Leu	Leu	Phe	Ile	Ser	Phe	Tyr	Ile
	290					295				300					
Gln	Ser	Tyr	Lys	Lys	Gly	Gly	Lys	Lys	Thr	Val	Lys	Lys	Glu	Ser	Glu
305					310					315					320
Val	Ser	Gly	Ser	Val	Ala	Ser	Gly	Ser	Ser	Thr	Gly	Val	Lys	Thr	Ser
			325						330					335	
Asn	Thr	Lys	Val	Ser	Ser	Arg	Lys	Ala							
			340					345							

```
<210> 15
<211> 587
<212> DNA
<213> Mortierella alpina
```

<400>	15						
tctcgaccca	gagagaggtc	gccatgtgga	ctatcactta	cttcgctcgtc	atcttttggtg		60
gtcgccagat	catgaagagc	caggacgcct	tcaagctcaa	gccccctcttc	atcctccaca		120
acttcctcct	gacgatcgcg	tccggatcgc	tgttgctcct	gttcacgcgag	aacctggtcc		180
ccatcctcgc	cagaaacgga	cttttctacg	ccatctgcga	cgacggtgcc	tggaaccagc		240
gcctcgagct	cctctactac	ctcaactacc	tggtcaagta	ctgggagttg	gccgacaccg		300
tctttttggt	cctcaagaag	aagcctcttg	agttcctgca	ctacttccac	cactcgatga		360
ccatggttct	ctgctttgtc	cagctttggag	gatacacttc	agtgtcctgc	gtccctatta		420
ccctcaactt	gactgtccac	gtcttcatgt	actactacta	catgcgctcc	gctgccggtg		480
ttcgcattctg	gtggaagcag	tacttgacca	ctctccagat	cgtccagttc	gttcttgacc		540
tcggattcat	ctacttctgc	qcctacacct	acttcgcctt	cacctac			587

```
<210> 16
<211> 590
<212> DNA
<213> Saccharomyces cerevisiae
```

<400> 16


```

cattaagcac tttgccccct gtgctatacg ccatcactgc ctattacggt attatTTTTg 60
gtggcagggt tttgttaagt aagtcgaaac catttaaatt aaatggcctt ttccaattgc 120
ataatttggg ttttaacttca ctttcattga cgcttttatt gcttatgggt gaacaattag 180
tgccaattat tggtcagcac gggttatact tcgctatctg taatattggg gcttggactc 240
aaccgctcgt tacattatat tacatgaatt acattgtcaa gtttattgaa tttatagaca 300
cctttttctt ggtgctaaaa cataaaaaat tgacattttt gcatacttat caccatggcg 360
ctactgcctt attatgttac acccaattga tgggcaccac atctatttct tgggtcccta 420
tttcattgaa ccttggtggt cacgtgggta tgtattggta ctatttcttg gctgccagag 480
gcatcagggg ctggtggaag gaatggggtta ccagatttca aattatccaa tttgttttgg 540
atatcggttt catatatatt gctgtctacc aaaaagcagt tcacttgtat 590

```

<210> 17

<211> 278

<212> PRT

<213> *Caenorhabditis elegans*

<400> 17

```

Arg Thr Phe Lys Met Met Asp Gln Ile Leu Gly Thr Asn Phe Thr Tyr
 1          5          10          15
Glu Gly Ala Lys Glu Val Ala Arg Gly Leu Glu Gly Phe Ser Ala Lys
          20          25          30
Leu Ala Val Gly Tyr Ile Ala Thr Ile Phe Gly Leu Lys Tyr Tyr Met
          35          40          45
Lys Asp Arg Lys Ala Phe Asp Leu Ser Thr Pro Leu Asn Ile Trp Asn
          50          55          60
Gly Ile Leu Ser Thr Phe Ser Leu Leu Gly Phe Leu Phe Thr Phe Pro
65          70          75          80
Thr Leu Leu Ser Val Ile Arg Lys Asp Gly Phe Ser His Thr Tyr Ser
          85          90          95
His Val Ser Glu Leu Tyr Thr Asp Ser Thr Ser Gly Tyr Trp Ile Phe
          100          105          110
Leu Trp Val Ile Ser Lys Ile Pro Glu Leu Leu Asp Thr Val Phe Ile
          115          120          125
Val Leu Arg Lys Arg Pro Leu Ile Phe Met His Trp Tyr His His Ala
          130          135          140
Leu Thr Gly Tyr Tyr Ala Leu Val Cys Tyr His Glu Asp Ala Val His
145          150          155          160
Met Val Trp Val Val Trp Met Asn Tyr Ile Ile His Ala Phe Met Tyr
          165          170          175
Gly Tyr Tyr Leu Leu Lys Ser Leu Lys Val Pro Ile Pro Pro Ser Val
          180          185          190
Ala Gln Ala Ile Thr Thr Ser Gln Met Val Gln Phe Ala Val Ala Ile
          195          200          205
Phe Ala Gln Val His Val Ser Tyr Lys His Tyr Val Glu Gly Val Glu
          210          215          220
Gly Leu Ala Tyr Ser Phe Arg Gly Thr Ala Ile Gly Phe Phe Met Leu
225          230          235          240
Thr Thr Tyr Phe Tyr Leu Trp Ile Gln Phe Tyr Lys Glu His Tyr Leu
          245          250          255
Lys Asn Gly Gly Lys Lys Tyr Asn Leu Ala Lys Asp Gln Ala Lys Thr
          260          265          270
Gln Thr Lys Lys Ala Asn
          275

```

<210> 18

<211> 293

<212> PRT

<213> Mortierella alpina

<220>

<221> VARIANT

 $\langle 222 \rangle \quad (293) \dots (293)$

<223> Xaa = Unknown or Other at position 293

<400> 18

[illegible]

<210> 19

<211> 238

<212> PRT

<213> Caenorhabditis elegans

<400> 19

Ser Leu Leu Thr Asn Gln Asp Glu Val Phe Pro His Ile Arg Ala Arg
1 5 10 15
Arg Phe Ile Gln Glu His Phe Gly Leu Phe Val Gln Met Ala Ile Ala
20 25 30

```

Tyr Val Ile Leu Val Phe Ser Ile Lys Arg Phe Met Arg Asp Arg Glu
    35              40              45
Pro Phe Gln Leu Thr Thr Ala Leu Arg Leu Trp Asn Phe Phe Leu Ser
    50              55              60
Val Phe Ser Ile Tyr Gly Ser Trp Thr Met Phe Pro Phe Met Val Gln
65    70              75              80
Gln Ile Arg Leu Tyr Gly Leu Tyr Gly Cys Gly Cys Glu Ala Leu Ser
    85              90              95
Asn Leu Pro Ser Gln Ala Glu Tyr Trp Leu Phe Leu Thr Ile Leu Ser
    100             105             110
Lys Ala Val Glu Phe Val Asp Thr Phe Phe Leu Val Leu Arg Lys Lys
    115             120             125
Pro Leu Ile Phe Leu His Trp Tyr His His Met Ala Thr Phe Val Phe
    130             135             140
Phe Cys Ser Asn Tyr Pro Thr Pro Ser Ser Gln Ser Arg Val Gly Val
145    150             155             160
Ile Val Asn Leu Phe Val His Ala Phe Met Tyr Pro Tyr Tyr Phe Thr
    165             170             175
Arg Ser Met Asn Ile Lys Val Pro Ala Lys Ile Ser Met Ala Val Thr
    180             185             190
Val Leu Gln Leu Thr Gln Phe Met Cys Phe Ile Tyr Gly Cys Thr Leu
    195             200             205
Met Tyr Tyr Ser Leu Ala Thr Asn Gln Ala Arg Tyr Pro Ser Asn Thr
    210             215             220
Pro Ala Thr Leu Gln Cys Leu Ser Tyr Thr Leu His Leu Leu
225    230             235

```

<210> 20

<211> 289

<212> PRT

<213> Mortierella alpina

<220>

<221> VARIANT

<222> (289)...(289)

<223> Xaa = Unknown or Other at position 289

<400> 20

```

Glu Leu Val Thr Gly Lys Ser Ile Asp Ser Phe Val Phe Gln Glu Gly
 1    5              10              15
Val Thr Pro Leu Ser Thr Gln Arg Glu Val Ala Met Trp Thr Ile Thr
    20              25              30
Tyr Phe Val Val Ile Phe Gly Gly Arg Gln Ile Met Lys Ser Gln Asp
    35              40              45
Ala Phe Lys Leu Lys Pro Leu Phe Ile Leu His Asn Phe Leu Leu Thr
    50              55              60
Ile Ala Ser Gly Ser Leu Leu Leu Leu Phe Ile Glu Asn Leu Val Pro
65    70              75              80
Ile Leu Ala Arg Asn Gly Leu Phe Tyr Ala Ile Cys Asp Asp Gly Ala
    85              90              95
Trp Thr Gln Arg Leu Glu Leu Leu Tyr Tyr Leu Asn Tyr Leu Val Lys
    100             105             110
Tyr Trp Glu Leu Ala Asp Thr Val Phe Leu Val Leu Lys Lys Lys Pro
    115             120             125
Leu Glu Phe Leu His Tyr Phe His His Ser Met Thr Met Val Leu Cys
    130             135             140
Phe Val Gln Leu Gly Gly Tyr Thr Ser Val Ser Trp Val Pro Ile Thr

```

```

145              150              155              160
Leu Asn Leu Thr Val His Val Phe Met Tyr Tyr Tyr Tyr Met Arg Ser
              165              170              175
Ala Ala Gly Val Arg Ile Trp Trp Lys Gln Tyr Leu Thr Thr Leu Gln
              180              185              190
Ile Val Gln Phe Val Leu Asp Leu Gly Phe Ile Tyr Phe Cys Ala Tyr
              195              200              205
Thr Tyr Phe Ala Phe Thr Tyr Phe Pro Trp Ala Pro Asn Val Gly Lys
              210              215              220
Cys Ala Gly Thr Glu Gly Ala Ala Leu Phe Gly Cys Gly Leu Leu Ser
225              230              235              240
Ser Tyr Leu Leu Leu Phe Ile Asn Phe Tyr Arg Ile Thr Tyr Asn Ala
              245              250              255
Lys Ala Lys Ala Ala Lys Glu Arg Gly Ser Asn Phe Thr Pro Lys Thr
              260              265              270
Val Lys Ser Gly Gly Ser Pro Lys Lys Pro Ser Lys Ser Lys His Ile
              275              280              285
Xaa

```

```

<210> 21
<211> 101
<212> PRT
<213> Caenorhabditis elegans

```

```

<400> 21
Met Leu Tyr Ser Ile Thr Arg Arg Cys Tyr Thr Phe Phe Val Thr Ser
 1              5              10              15
Leu His Phe Tyr Gln Leu Tyr Val Thr Glu Cys Leu Glu Asn Val Ile
              20              25              30
Phe Asn Val Leu Val Asn Gly Gln Ser Ile Asn Ser Arg Trp Lys Asp
              35              40              45
Ala Glu Lys Thr Ile Thr Ser Phe Pro Phe His Phe Pro Gln Thr Phe
 50              55              60
Phe Gln Gln Pro His Ile Leu Thr Leu His Phe Leu Phe Phe Val Phe
65              70              75              80
Val Ser Val Thr Leu Val Thr Val Phe Lys Lys Pro Lys Cys Glu Phe
              85              90              95
Pro His Ser Leu Ala
              100

```

```

<210> 22
<211> 115
<212> PRT
<213> Mortierella alpina

```

```

<400> 22
Met Ala Ala Ala Ile Leu Asp Lys Val Asn Phe Gly Ile Asp Gln Pro
 1              5              10              15
Phe Gly Ile Lys Leu Asp Thr Tyr Phe Ala Gln Ala Tyr Glu Leu Val
              20              25              30
Thr Gly Lys Ser Ile Asp Ser Phe Val Phe Gln Glu Gly Val Thr Pro
              35              40              45
Leu Ser Thr Gln Arg Glu Val Ala Met Trp Thr Ile Thr Tyr Phe Val
 50              55              60
Val Ile Phe Gly Gly Arg Gln Ile Met Lys Ser Gln Asp Ala Phe Lys
65              70              75              80

```

Leu Lys Pro Leu Phe Ile Leu His Asn Phe Leu Leu Thr Ile Ala Ser
 85 90 95
 Gly Ser Leu Leu Leu Leu Phe Ile Glu Asn Leu Val Pro Ile Leu Ala
 100 105 110
 Arg Asn Gly
 115

<210> 23
 <211> 272
 <212> PRT
 <213> Mus musculus

<220>
 <221> VARIANT
 <222> (272)...(272)
 <223> Xaa = Unknown or Other at position 272

<400> 23
 Met Asp Thr Ser Met Asn Phe Ser Arg Gly Leu Lys Met Asp Leu Met
 1 5 10 15
 Gln Pro Tyr Asp Phe Glu Thr Phe Gln Asp Leu Arg Pro Phe Leu Glu
 20 25 30
 Glu Tyr Trp Val Ser Ser Phe Leu Ile Val Val Val Tyr Leu Leu Leu
 35 40 45
 Ile Val Val Gly Gln Thr Tyr Met Arg Thr Arg Lys Ser Phe Ser Leu
 50 55 60
 Gln Arg Pro Leu Ile Leu Trp Ser Phe Phe Leu Ala Ile Phe Ser Ile
 65 70 75 80
 Leu Gly Thr Leu Arg Met Trp Lys Phe Met Ala Thr Val Met Phe Thr
 85 90 95
 Val Gly Leu Lys Gln Thr Val Cys Phe Ala Ile Tyr Thr Asp Asp Ala
 100 105 110
 Val Val Arg Phe Trp Ser Phe Leu Phe Leu Leu Ser Lys Val Val Glu
 115 120 125
 Leu Gly Asp Thr Ala Phe Ile Ile Leu Arg Lys Arg Pro Leu Ile Phe
 130 135 140
 Val His Trp Tyr His His Ser Thr Val Leu Leu Phe Thr Ser Phe Gly
 145 150 155 160
 Tyr Lys Asn Lys Val Pro Ser Gly Gly Trp Phe Met Thr Met Asn Phe
 165 170 175
 Gly Val His Ser Val Met Tyr Thr Tyr Thr Met Lys Ala Ala Lys
 180 185 190
 Leu Lys His Pro Asn Leu Leu Pro Met Val Ile Thr Ser Leu Gln Ile
 195 200 205
 Leu Gln Met Val Leu Gly Thr Ile Phe Gly Ile Leu Asn Tyr Ile Trp
 210 215 220
 Arg Gln Glu Lys Gly Cys His Thr Thr Thr Glu His Phe Phe Trp Ser
 225 230 235 240
 Phe Met Leu Tyr Gly Thr Tyr Phe Ile Leu Phe Ala His Phe Phe His
 245 250 255
 Arg Ala Tyr Leu Arg Pro Lys Gly Lys Val Ala Ser Lys Ser Gln Xaa
 260 265 270

<210> 24
 <211> 318
 <212> PRT
 <213> Mortierella alpina

<220>

<221> VARIANT

<222> (318)...(318)

<223> Xaa = Unknown or Other at position 318

<400> 24

```

Met Ala Ala Ala Ile Leu Asp Lys Val Asn Phe Gly Ile Asp Gln Pro
1          5          10          15
Phe Gly Ile Lys Leu Asp Thr Tyr Phe Ala Gln Ala Tyr Glu Leu Val
20          25          30
Thr Gly Lys Ser Ile Asp Ser Phe Val Phe Gln Glu Gly Val Thr Pro
35          40          45
Leu Ser Thr Gln Arg Glu Val Ala Met Trp Thr Ile Thr Tyr Phe Val
50          55          60
Val Ile Phe Gly Gly Arg Gln Ile Met Lys Ser Gln Asp Ala Phe Lys
65          70          75          80
Leu Lys Pro Leu Phe Ile Leu His Asn Phe Leu Leu Thr Ile Ala Ser
85          90          95
Gly Ser Leu Leu Leu Leu Phe Ile Glu Asn Leu Val Pro Ile Leu Ala
100         105         110
Arg Asn Gly Leu Phe Tyr Ala Ile Cys Asp Asp Gly Ala Trp Thr Gln
115         120         125
Arg Leu Glu Leu Leu Tyr Tyr Leu Asn Tyr Leu Val Lys Tyr Trp Glu
130         135         140
Leu Ala Asp Thr Val Phe Leu Val Leu Lys Lys Lys Pro Leu Glu Phe
145         150         155         160
Leu His Tyr Phe His His Ser Met Thr Met Val Leu Cys Phe Val Gln
165         170         175
Leu Gly Gly Tyr Thr Ser Val Ser Trp Val Pro Ile Thr Leu Asn Leu
180         185         190
Thr Val His Val Phe Met Tyr Tyr Tyr Tyr Met Arg Ser Ala Ala Gly
195         200         205
Val Arg Ile Trp Trp Lys Gln Tyr Leu Thr Thr Leu Gln Ile Val Gln
210         215         220
Phe Val Leu Asp Leu Gly Phe Ile Tyr Phe Cys Ala Tyr Thr Tyr Phe
225         230         235         240
Ala Phe Thr Tyr Phe Pro Trp Ala Pro Asn Val Gly Lys Cys Ala Gly
245         250         255
Thr Glu Gly Ala Ala Leu Phe Gly Cys Gly Leu Leu Ser Ser Tyr Leu
260         265         270
Leu Leu Phe Ile Asn Phe Tyr Arg Ile Thr Tyr Asn Ala Lys Ala Lys
275         280         285
Ala Ala Lys Glu Arg Gly Ser Asn Phe Thr Pro Lys Thr Val Lys Ser
290         295         300
Gly Gly Ser Pro Lys Lys Pro Ser Lys Ser Lys His Ile Xaa
305         310         315

```

<210> 25

<211> 178

<212> PRT

<213> Mortierella alpina

<400> 25

```

Asn Leu Val Pro Ile Leu Ala Arg Asn Gly Leu Phe Tyr Ala Ile Cys
1          5          10          15
Asp Asp Gly Ala Trp Thr Gln Arg Leu Glu Leu Leu Tyr Tyr Leu Asn

```

[illegible]

```
<210> 26
<211> 147
<212> PRT
<213> Homo sapiens
```

[illegible]

```
<210> 27
<211> 280
<212> PRT
<213> Mortierella alpina
```

```
<220>
<221> VARIANT
<222> (280) . . . (280)
```

<223> Xaa = Unknown or Other at position 280

<400> 27

Ser	Phe	Val	Phe	Gln	Glu	Gly	Val	Thr	Pro	Leu	Ser	Thr	Gln	Arg	Glu
1				5					10					15	
Val	Ala	Met	Trp	Thr	Ile	Thr	Tyr	Phe	Val	Val	Ile	Phe	Gly	Gly	Arg
		20						25					30		
Gln	Ile	Met	Lys	Ser	Gln	Asp	Ala	Phe	Lys	Leu	Lys	Pro	Leu	Phe	Ile
		35					40					45			
Leu	His	Asn	Phe	Leu	Leu	Thr	Ile	Ala	Ser	Gly	Ser	Leu	Leu	Leu	Leu
	50					55					60				
Phe	Ile	Glu	Asn	Leu	Val	Pro	Ile	Leu	Ala	Arg	Asn	Gly	Leu	Phe	Tyr
65					70					75					80
Ala	Ile	Cys	Asp	Asp	Gly	Ala	Trp	Thr	Gln	Arg	Leu	Glu	Leu	Leu	Tyr
			85						90					95	
Tyr	Leu	Asn	Tyr	Leu	Val	Lys	Tyr	Trp	Glu	Leu	Ala	Asp	Thr	Val	Phe
		100						105					110		
Leu	Val	Leu	Lys	Lys	Lys	Pro	Leu	Glu	Phe	Leu	His	Tyr	Phe	His	His
		115					120					125			
Ser	Met	Thr	Met	Val	Leu	Cys	Phe	Val	Gln	Leu	Gly	Gly	Tyr	Thr	Ser
	130					135					140				
Val	Ser	Trp	Val	Pro	Ile	Thr	Leu	Asn	Leu	Thr	Val	His	Val	Phe	Met
145					150					155					160
Tyr	Tyr	Tyr	Tyr	Met	Arg	Ser	Ala	Ala	Gly	Val	Arg	Ile	Trp	Trp	Lys
			165						170					175	
Gln	Tyr	Leu	Thr	Thr	Leu	Gln	Ile	Val	Gln	Phe	Val	Leu	Asp	Leu	Gly
			180					185					190		
Phe	Ile	Tyr	Phe	Cys	Ala	Tyr	Thr	Tyr	Phe	Ala	Phe	Thr	Tyr	Phe	Pro
		195					200					205			
Trp	Ala	Pro	Asn	Val	Gly	Lys	Cys	Ala	Gly	Thr	Glu	Gly	Ala	Ala	Leu
	210					215					220				
Phe	Gly	Cys	Gly	Leu	Leu	Ser	Ser	Tyr	Leu	Leu	Leu	Phe	Ile	Asn	Phe
225					230					235					240
Tyr	Arg	Ile	Thr	Tyr	Asn	Ala	Lys	Ala	Lys	Ala	Ala	Lys	Glu	Arg	Gly
			245						250					255	
Ser	Asn	Phe	Thr	Pro	Lys	Thr	Val	Lys	Ser	Gly	Gly	Ser	Pro	Lys	Lys
		260						265					270		
Pro	Ser	Lys	Ser	Lys	His	Ile	Xaa								
		275					280								

<210> 28

<211> 283

<212> PRT

<213> Unknown

<220>

<223> Potential Mammalian Elongase

<221> VARIANT

<222> (282)...(282)

<223> Xaa = Unknown or Other at position 282

<400> 28

Pro	Arg	Tyr	Lys	Ser	Gln	Arg	Met	Val	Pro	Pro	Gly	Gln	Leu	His	Pro
1				5					10					15	
Tyr	Val	Cys	Leu	Phe	Cys	Tyr	Leu	Leu	Thr	His	Cys	Met	Ala	Gly	Thr
		20						25					30		

Lys	Ile	His	Glu	Glu	Pro	Ala	Ala	Val	Leu	Leu	Pro	Ser	Ile	Leu	Gln
		35					40					45			
Leu	Tyr	Asn	Leu	Gly	Leu	Thr	Leu	Leu	Ser	Leu	Tyr	Met	Phe	Tyr	Glu
	50					55				60					
Leu	Val	Thr	Gly	Val	Trp	Glu	Gly	Lys	Tyr	Asn	Phe	Phe	Cys	Gln	Gly
65					70				75					80	
Thr	Arg	Ser	Ala	Gly	Glu	Ser	Asp	Met	Lys	Ile	Ile	Arg	Val	Leu	Trp
				85					90					95	
Trp	Tyr	Tyr	Phe	Ser	Lys	Leu	Ile	Glu	Phe	Met	Asp	Thr	Phe	Phe	Phe
			100					105					110		
Ile	Leu	Arg	Lys	Asn	Asn	His	Gln	Ile	Thr	Val	Leu	His	Val	Tyr	His
		115					120					125			
His	Ala	Thr	Met	Leu	Asn	Ile	Trp	Trp	Phe	Val	Met	Asn	Trp	Val	Pro
	130					135					140				
Cys	Gly	His	Ser	Tyr	Phe	Gly	Ala	Thr	Leu	Asn	Ser	Phe	Ile	His	Val
145					150					155					160
Leu	Met	Tyr	Ser	Tyr	Tyr	Gly	Leu	Ser	Ser	Ile	Pro	Ser	Met	Arg	Pro
				165					170					175	
Tyr	Leu	Trp	Trp	Lys	Lys	Tyr	Ile	Thr	Gln	Gly	Gln	Leu	Val	Gln	Phe
			180					185						190	
Val	Leu	Thr	Ile	Ile	Gln	Thr	Thr	Cys	Gly	Val	Phe	Trp	Pro	Cys	Ser
		195					200					205			
Phe	Pro	Leu	Gly	Trp	Leu	Phe	Phe	Gln	Ile	Gly	Tyr	Met	Ile	Ser	Leu
	210					215					220				
Ile	Ala	Leu	Phe	Thr	Asn	Phe	Tyr	Ile	Gln	Thr	Tyr	Asn	Lys	Lys	Gly
225					230					235					240
Ala	Ser	Arg	Arg	Lys	Glu	His	Leu	Lys	Gly	His	Gln	Asn	Gly	Ser	Val
				245					250					255	
Ala	Ala	Val	Asn	Gly	His	Thr	Asn	Ser	Phe	Pro	Ser	Leu	Glu	Asn	Ser
			260				265						270		
Val	Lys	Pro	Arg	Lys	Gln	Arg	Lys	Asp	Xaa	Gln					
		275					280								

<210> 29

<211> 446

<212> PRT

<213> Mortierella alpina

<400> 29

Met	Gly	Thr	Asp	Gln	Gly	Lys	Thr	Phe	Thr	Trp	Glu	Glu	Leu	Ala	Ala
1				5					10					15	
His	Asn	Thr	Lys	Asp	Asp	Leu	Leu	Leu	Ala	Ile	Arg	Gly	Arg	Val	Tyr
			20					25					30		
Asp	Val	Thr	Lys	Phe	Leu	Ser	Arg	His	Pro	Gly	Gly	Val	Asp	Thr	Leu
		35					40					45			
Leu	Leu	Gly	Ala	Gly	Arg	Asp	Val	Thr	Pro	Val	Phe	Glu	Met	Tyr	His
	50					55					60				
Ala	Phe	Gly	Ala	Ala	Asp	Ala	Ile	Met	Lys	Lys	Tyr	Tyr	Val	Gly	Thr
65					70				75					80	
Leu	Val	Ser	Asn	Glu	Leu	Pro	Ile	Phe	Pro	Glu	Pro	Thr	Val	Phe	His
				85					90					95	
Lys	Thr	Ile	Lys	Thr	Arg	Val	Glu	Gly	Tyr	Phe	Thr	Asp	Arg	Asn	Ile
			100					105					110		
Asp	Pro	Lys	Asn	Arg	Pro	Glu	Ile	Trp	Gly	Arg	Tyr	Ala	Leu	Ile	Phe
		115					120					125			
Gly	Ser	Leu	Ile	Ala	Ser	Tyr	Tyr	Ala	Gln	Leu	Phe	Val	Pro	Phe	Val
	130						135				140				

Val	Glu	Arg	Thr	Trp	Leu	Gln	Val	Val	Phe	Ala	Ile	Ile	Met	Gly	Phe
145					150				155						160
Ala	Cys	Ala	Gln	Val	Gly	Leu	Asn	Pro	Leu	His	Asp	Ala	Ser	His	Phe
			165						170						175
Ser	Val	Thr	His	Asn	Pro	Thr	Val	Trp	Lys	Ile	Leu	Gly	Ala	Thr	His
			180					185					190		
Asp	Phe	Phe	Asn	Gly	Ala	Ser	Tyr	Leu	Val	Trp	Met	Tyr	Gln	His	Met
	195						200					205			
Leu	Gly	His	His	Pro	Tyr	Thr	Asn	Ile	Ala	Gly	Ala	Asp	Pro	Asp	Val
	210					215					220				
Ser	Thr	Ser	Glu	Pro	Asp	Val	Arg	Arg	Ile	Lys	Pro	Asn	Gln	Lys	Trp
225					230					235					240
Phe	Val	Asn	His	Ile	Asn	Gln	His	Met	Phe	Val	Pro	Phe	Leu	Tyr	Gly
			245						250						255
Leu	Leu	Ala	Phe	Lys	Val	Arg	Ile	Gln	Asp	Ile	Asn	Ile	Leu	Tyr	Phe
		260						265					270		
Val	Lys	Thr	Asn	Asp	Ala	Ile	Arg	Val	Asn	Pro	Ile	Ser	Thr	Trp	His
	275						280					285			
Thr	Val	Met	Phe	Trp	Gly	Gly	Lys	Ala	Phe	Phe	Val	Trp	Tyr	Arg	Leu
	290					295					300				
Ile	Val	Pro	Leu	Gln	Tyr	Leu	Pro	Leu	Gly	Lys	Val	Leu	Leu	Leu	Phe
305					310					315					320
Thr	Val	Ala	Asp	Met	Val	Ser	Ser	Tyr	Trp	Leu	Ala	Leu	Thr	Phe	Gln
			325						330						335
Ala	Asn	His	Val	Val	Glu	Glu	Val	Gln	Trp	Pro	Leu	Pro	Asp	Glu	Asn
		340						345					350		
Gly	Ile	Ile	Gln	Lys	Asp	Trp	Ala	Ala	Met	Gln	Val	Glu	Thr	Thr	Gln
	355						360					365			
Asp	Tyr	Ala	His	Asp	Ser	His	Leu	Trp	Thr	Ser	Ile	Thr	Gly	Ser	Leu
	370					375					380				
Asn	Tyr	Gln	Ala	Val	His	His	Leu	Phe	Pro	Asn	Val	Ser	Gln	His	His
385					390					395					400
Tyr	Pro	Asp	Ile	Leu	Ala	Ile	Ile	Lys	Asn	Thr	Cys	Ser	Glu	Tyr	Lys
			405						410					415	
Val	Pro	Tyr	Leu	Val	Lys	Asp	Thr	Phe	Trp	Gln	Ala	Phe	Ala	Ser	His
			420					425					430		
Leu	Glu	His	Leu	Arg	Val	Leu	Gly	Leu	Arg	Pro	Lys	Glu	Glu		
	435						440					445			

<210> 30

<211> 318

<212> PRT

<213> Mortierella alpina

<400> 30

Met	Glu	Ser	Ile	Ala	Pro	Phe	Leu	Pro	Ser	Lys	Met	Pro	Gln	Asp	Leu
1				5					10					15	
Phe	Met	Asp	Leu	Ala	Thr	Ala	Ile	Gly	Val	Arg	Ala	Ala	Pro	Tyr	Val
			20					25					30		
Asp	Pro	Leu	Glu	Ala	Ala	Leu	Val	Ala	Gln	Ala	Glu	Lys	Tyr	Ile	Pro
		35					40					45			
Thr	Ile	Val	His	His	Thr	Arg	Gly	Phe	Leu	Val	Ala	Val	Glu	Ser	Pro
	50					55					60				
Leu	Ala	Arg	Glu	Leu	Pro	Leu	Met	Asn	Pro	Phe	His	Val	Leu	Leu	Ile
65					70					75					80
Val	Leu	Ala	Tyr	Leu	Val	Thr	Val	Phe	Val	Gly	Met	Gln	Ile	Met	Lys
				85					90					95	

Asn	Phe	Glu	Arg	Phe	Glu	Val	Lys	Thr	Phe	Ser	Leu	Leu	His	Asn	Phe	
			100					105					110			
Cys	Leu	Val	Ser	Ile	Ser	Ala	Tyr	Met	Cys	Gly	Gly	Ile	Leu	Tyr	Glu	
		115					120					125				
Ala	Tyr	Gln	Ala	Asn	Tyr	Gly	Leu	Phe	Glu	Asn	Ala	Ala	Asp	His	Thr	
	130					135					140					
Phe	Lys	Gly	Leu	Pro	Met	Ala	Lys	Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	
145					150					155					160	
Lys	Ile	Met	Glu	Phe	Val	Asp	Thr	Met	Ile	Met	Val	Leu	Lys	Lys	Asn	
			165					170						175		
Asn	Arg	Gln	Ile	Ser	Phe	Leu	His	Val	Tyr	His	His	Ser	Ser	Ile	Phe	
		180						185					190			
Thr	Ile	Trp	Trp	Leu	Val	Thr	Phe	Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	
	195						200					205				
Phe	Ser	Ala	Ala	Leu	Asn	Ser	Phe	Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	
	210				215						220					
Tyr	Phe	Leu	Ser	Ala	Leu	Gly	Phe	Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	
225					230					235					240	
Tyr	Ile	Thr	Arg	Ser	Gln	Met	Thr	Gln	Phe	Cys	Met	Met	Ser	Val	Gln	
			245					250						255		
Ser	Ser	Trp	Asp	Met	Tyr	Ala	Met	Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	
		260					265						270			
Pro	Phe	Phe	Ile	Thr	Ala	Leu	Leu	Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	
	275					280					285					
Gly	Leu	Phe	Tyr	Asn	Phe	Tyr	Arg	Lys	Asn	Ala	Lys	Leu	Ala	Lys	Gln	
	290				295					300						
Ala	Lys	Ala	Asp	Ala	Ala	Lys	Glu	Lys	Ala	Arg	Lys	Leu	Gln			
305					310					315						

<210> 31

<211> 279

<212> PRT

<213> Mortierella alpina

<400> 31

Val	Ala	Gln	Ala	Glu	Lys	Tyr	Ile	Pro	Thr	Ile	Val	His	His	Thr	Arg	
1				5				10						15		
Gly	Phe	Leu	Val	Ala	Val	Glu	Ser	Pro	Leu	Ala	Arg	Glu	Leu	Pro	Leu	
		20					25						30			
Met	Asn	Pro	Phe	His	Val	Leu	Leu	Ile	Val	Leu	Ala	Tyr	Leu	Val	Thr	
	35					40					45					
Val	Phe	Val	Gly	Met	Gln	Ile	Met	Lys	Asn	Phe	Glu	Arg	Phe	Glu	Val	
	50				55					60						
Lys	Thr	Phe	Ser	Leu	Leu	His	Asn	Phe	Cys	Leu	Val	Ser	Ile	Ser	Ala	
65				70					75					80		
Tyr	Met	Cys	Gly	Gly	Ile	Leu	Tyr	Glu	Ala	Tyr	Gln	Ala	Asn	Tyr	Gly	
			85					90					95			
Leu	Phe	Glu	Asn	Ala	Ala	Asp	His	Thr	Phe	Lys	Gly	Leu	Pro	Met	Ala	
		100					105						110			
Lys	Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	Lys	Ile	Met	Glu	Phe	Val	Asp	
	115					120					125					
Thr	Met	Ile	Met	Val	Leu	Lys	Asn	Asn	Arg	Gln	Ile	Ser	Phe	Leu		
	130				135					140						
His	Val	Tyr	His	His	Ser	Ser	Ile	Phe	Thr	Ile	Trp	Trp	Leu	Val	Thr	
145				150					155					160		
Phe	Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	Phe	Ser	Ala	Ala	Leu	Asn	Ser	
				165				170						175		

Phe	Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	Tyr	Phe	Leu	Ser	Ala	Leu	Gly
			180					185					190		
Phe	Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	Tyr	Ile	Thr	Arg	Ser	Gln	Met
		195					200					205			
Thr	Gln	Phe	Cys	Met	Met	Ser	Val	Gln	Ser	Ser	Trp	Asp	Met	Tyr	Ala
	210					215					220				
Met	Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	Pro	Phe	Phe	Ile	Thr	Ala	Leu
225					230					235					240
Leu	Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	Gly	Leu	Phe	Tyr	Asn	Phe	Tyr
				245					250					255	
Arg	Lys	Asn	Ala	Lys	Leu	Ala	Lys	Gln	Ala	Lys	Ala	Asp	Ala	Ala	Lys
			260					265					270		
Glu	Lys	Ala	Arg	Lys	Leu	Gln									
			275												

<210> 32

<211> 301

<212> PRT

<213> Mortierella alpina

<220>

<221> VARIANT

<222> (301)...(301)

<223> Xaa = Unknown or Other at position 301

<400> 32

Gly	Ile	Lys	Leu	Asp	Thr	Tyr	Phe	Ala	Gln	Ala	Tyr	Glu	Leu	Val	Thr
1				5					10					15	
Gly	Lys	Ser	Ile	Asp	Ser	Phe	Val	Phe	Gln	Glu	Gly	Val	Thr	Pro	Leu
			20					25					30		
Ser	Thr	Gln	Arg	Glu	Val	Ala	Met	Trp	Thr	Ile	Thr	Tyr	Phe	Val	Val
		35					40					45			
Ile	Phe	Gly	Gly	Arg	Gln	Ile	Met	Lys	Ser	Gln	Asp	Ala	Phe	Lys	Leu
	50					55					60				
Lys	Pro	Leu	Phe	Ile	Leu	His	Asn	Phe	Leu	Leu	Thr	Ile	Ala	Ser	Gly
65					70					75					80
Ser	Leu	Leu	Leu	Leu	Phe	Ile	Glu	Asn	Leu	Val	Pro	Ile	Leu	Ala	Arg
				85				90						95	
Asn	Gly	Leu	Phe	Tyr	Ala	Ile	Cys	Asp	Asp	Gly	Ala	Trp	Thr	Gln	Arg
			100					105					110		
Leu	Glu	Leu	Leu	Tyr	Tyr	Leu	Asn	Tyr	Leu	Val	Lys	Tyr	Trp	Glu	Leu
			115				120					125			
Ala	Asp	Thr	Val	Phe	Leu	Val	Leu	Lys	Lys	Lys	Pro	Leu	Glu	Phe	Leu
	130					135					140				
His	Tyr	Phe	His	His	Ser	Met	Thr	Met	Val	Leu	Cys	Phe	Val	Gln	Leu
145					150					155					160
Gly	Gly	Tyr	Thr	Ser	Val	Ser	Trp	Val	Pro	Ile	Thr	Leu	Asn	Leu	Thr
				165					170					175	
Val	His	Val	Phe	Met	Tyr	Tyr	Tyr	Tyr	Met	Arg	Ser	Ala	Ala	Gly	Val
			180					185					190		
Arg	Ile	Trp	Trp	Lys	Gln	Tyr	Leu	Thr	Thr	Leu	Gln	Ile	Val	Gln	Phe
		195					200					205			
Val	Leu	Asp	Leu	Gly	Phe	Ile	Tyr	Phe	Cys	Ala	Tyr	Thr	Tyr	Phe	Ala
	210					215					220				
Phe	Thr	Tyr	Phe	Pro	Trp	Ala	Pro	Asn	Val	Gly	Lys	Cys	Ala	Gly	Thr
225					230					235					240
Glu	Gly	Ala	Ala	Leu	Phe	Gly	Cys	Gly	Leu	Leu	Ser	Ser	Tyr	Leu	Leu

				245					250				255				
Leu	Phe	Ile	Asn	Phe	Tyr	Arg	Ile	Thr	Tyr	Asn	Ala	Lys	Ala	Lys	Ala		
			260					265					270				
Ala	Lys	Glu	Arg	Gly	Ser	Asn	Phe	Thr	Pro	Lys	Thr	Val	Lys	Ser	Gly		
		275					280					285					
Gly	Ser	Pro	Lys	Lys	Pro	Ser	Lys	Ser	Lys	His	Ile	Xaa					
	290					295					300						

<210> 33
 <211> 289
 <212> PRT
 <213> *Mortierella alpina*

<400> 33

Tyr	Glu	Leu	Val	Thr	Gly	Lys	Ser	Ile	Asp	Ser	Phe	Val	Phe	Gln	Glu		
1				5				10					15				
Gly	Val	Thr	Pro	Leu	Ser	Thr	Gln	Arg	Glu	Val	Ala	Met	Trp	Thr	Ile		
			20				25					30					
Thr	Tyr	Phe	Val	Val	Ile	Phe	Gly	Gly	Arg	Gln	Ile	Met	Lys	Ser	Gln		
		35				40					45						
Asp	Ala	Phe	Lys	Leu	Lys	Pro	Leu	Phe	Ile	Leu	His	Asn	Phe	Leu	Leu		
	50				55				60								
Thr	Ile	Ala	Ser	Gly	Ser	Leu	Leu	Leu	Phe	Ile	Glu	Asn	Leu	Val			
65				70				75					80				
Pro	Ile	Leu	Ala	Arg	Asn	Gly	Leu	Phe	Tyr	Ala	Ile	Cys	Asp	Asp	Gly		
			85					90				95					
Ala	Trp	Thr	Gln	Arg	Leu	Glu	Leu	Leu	Tyr	Tyr	Leu	Asn	Tyr	Leu	Val		
			100				105					110					
Lys	Tyr	Trp	Glu	Leu	Ala	Asp	Thr	Val	Phe	Leu	Val	Leu	Lys	Lys	Lys		
		115				120					125						
Pro	Leu	Glu	Phe	Leu	His	Tyr	Phe	His	His	Ser	Met	Thr	Met	Val	Leu		
	130				135					140							
Cys	Phe	Val	Gln	Leu	Gly	Gly	Tyr	Thr	Ser	Val	Ser	Trp	Val	Pro	Ile		
145				150				155						160			
Thr	Leu	Asn	Leu	Thr	Val	His	Val	Phe	Met	Tyr	Tyr	Tyr	Tyr	Met	Arg		
			165					170						175			
Ser	Ala	Ala	Gly	Val	Arg	Ile	Trp	Trp	Lys	Gln	Tyr	Leu	Thr	Thr	Leu		
			180				185						190				
Gln	Ile	Val	Gln	Phe	Val	Leu	Asp	Leu	Gly	Phe	Ile	Tyr	Phe	Cys	Ala		
	195					200					205						
Tyr	Thr	Tyr	Phe	Ala	Phe	Thr	Tyr	Phe	Pro	Trp	Ala	Pro	Asn	Val	Gly		
	210				215				220								
Lys	Cys	Ala	Gly	Thr	Glu	Gly	Ala	Ala	Leu	Phe	Gly	Cys	Gly	Leu	Leu		
225				230				235						240			
Ser	Ser	Tyr	Leu	Leu	Leu	Phe	Ile	Asn	Phe	Tyr	Arg	Ile	Thr	Tyr	Asn		
			245			250							255				
Ala	Lys	Ala	Lys	Ala	Ala	Lys	Glu	Arg	Gly	Ser	Asn	Phe	Thr	Pro	Lys		
		260				265						270					
Thr	Val	Lys	Ser	Gly	Gly	Ser	Pro	Lys	Lys	Pro	Ser	Lys	Ser	Lys	His		
		275				280						285					

Ile

<210> 34
 <211> 292
 <212> PRT
 <213> *Homo sapiens*

<220>

<221> VARIANT

<222> (292)...(292)

<223> Xaa = Unknown or Other at position 292

<400> 34

Ser	Thr	Tyr	Phe	Lys	Ala	Leu	Leu	Gly	Pro	Arg	Asp	Thr	Arg	Val	Lys
1				5					10					15	
Gly	Trp	Phe	Leu	Leu	Asp	Asn	Tyr	Ile	Pro	Thr	Phe	Ile	Cys	Ser	Val
			20					25					30		
Ile	Tyr	Leu	Leu	Ile	Val	Trp	Leu	Gly	Pro	Lys	Tyr	Met	Arg	Asn	Lys
			35				40					45			
Gln	Pro	Phe	Ser	Cys	Arg	Gly	Ile	Leu	Val	Val	Tyr	Asn	Leu	Gly	Leu
	50					55				60					
Thr	Leu	Leu	Ser	Leu	Tyr	Met	Phe	Cys	Glu	Leu	Val	Thr	Gly	Val	Trp
65					70					75					80
Glu	Gly	Lys	Tyr	Asn	Phe	Phe	Cys	Gln	Gly	Thr	Arg	Thr	Ala	Gly	Glu
				85					90					95	
Ser	Asp	Met	Lys	Ile	Ile	Arg	Val	Leu	Trp	Trp	Tyr	Tyr	Phe	Ser	Lys
			100					105					110		
Leu	Ile	Glu	Phe	Met	Asp	Thr	Phe	Phe	Phe	Ile	Leu	Arg	Lys	Asn	Asn
		115					120					125			
His	Gln	Ile	Thr	Val	Leu	His	Val	Tyr	His	His	Ala	Ser	Met	Leu	Asn
	130					135					140				
Ile	Trp	Trp	Phe	Val	Met	Asn	Trp	Val	Pro	Cys	Gly	His	Ser	Tyr	Phe
145					150					155					160
Gly	Ala	Thr	Leu	Asn	Ser	Phe	Ile	His	Val	Leu	Met	Tyr	Ser	Tyr	Tyr
				165					170					175	
Gly	Leu	Ser	Ser	Val	Pro	Ser	Met	Arg	Pro	Tyr	Leu	Trp	Trp	Lys	Lys
			180					185					190		
Tyr	Ile	Thr	Gln	Gly	Gln	Leu	Leu	Gln	Phe	Val	Leu	Thr	Ile	Ile	Gln
	195						200					205			
Thr	Ser	Cys	Gly	Val	Ile	Trp	Pro	Cys	Thr	Phe	Pro	Leu	Gly	Trp	Leu
	210					215					220				
Tyr	Phe	Gln	Ile	Gly	Tyr	Met	Ile	Ser	Leu	Ile	Ala	Leu	Phe	Thr	Asn
225					230					235					240
Phe	Tyr	Ile	Gln	Thr	Tyr	Asn	Lys	Lys	Gly	Ala	Ser	Arg	Arg	Lys	Asp
				245					250					255	
His	Leu	Lys	Asp	His	Gln	Asn	Gly	Ser	Met	Ala	Ala	Val	Asn	Gly	His
			260					265					270		
Thr	Asn	Ser	Phe	Ser	Pro	Leu	Glu	Asn	Asn	Val	Lys	Pro	Arg	Lys	Leu
		275					280						285		
Arg	Lys	Asp	Xaa												
		290													

<210> 35

<211> 291

<212> PRT

<213> Mortierella alpina

<400> 35

Gln	Ala	Tyr	Glu	Leu	Val	Thr	Gly	Lys	Ser	Ile	Asp	Ser	Phe	Val	Phe
1				5					10					15	
Gln	Glu	Gly	Val	Thr	Pro	Leu	Ser	Thr	Gln	Arg	Glu	Val	Ala	Met	Trp
			20					25					30		
Thr	Ile	Thr	Tyr	Phe	Val	Val	Ile	Phe	Gly	Gly	Arg	Gln	Ile	Met	Lys

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<210> 36
<211> 276
<212> PRT
<213> Homo sapiens
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<220>  
<221> VARIANT  
<222> (276)...(276)  
<223> Xaa = Unknown or Other at position 276
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<400> 36															
Val	Asn	Leu	Tyr	Gln	Glu	Val	Met	Lys	His	Ala	Asp	Pro	Arg	Ile	Gln
1				5					10					15	
Gly	Tyr	Pro	Leu	Met	Gly	Ser	Pro	Leu	Leu	Met	Thr	Ser	Ile	Leu	Leu
			20					25					30		
Thr	Tyr	Val	Tyr	Phe	Val	Leu	Ser	Leu	Gly	Pro	Arg	Ile	Met	Ala	Asn
		35					40					45			
Arg	Lys	Pro	Phe	Gln	Leu	Arg	Gly	Phe	Met	Ile	Val	Tyr	Asn	Phe	Ser
	50					55					60				
Leu	Val	Ala	Leu	Ser	Leu	Tyr	Ile	Val	Tyr	Glu	Phe	Leu	Met	Ser	Gly
65				70						75				80	
Trp	Leu	Ser	Thr	Tyr	Thr	Trp	Arg	Cys	Asp	Pro	Val	Asp	Tyr	Ser	Asn
				85					90					95	

Ser Pro Glu Ala Leu Arg Met Val Arg Val Ala Trp Leu Phe Leu Phe
 100 105 110
 Ser Lys Phe Ile Glu Leu Met Asp Thr Val Ile Phe Ile Leu Arg Lys
 115 120 125
 Lys Asp Gly Gln Val Thr Phe Leu His Val Phe His His Ser Val Leu
 130 135 140
 Pro Trp Ser Trp Trp Trp Gly Val Lys Ile Ala Pro Gly Gly Met Gly
 145 150 155 160
 Ser Phe His Ala Met Ile Asn Ser Ser Val His Val Ile Met Tyr Leu
 165 170 175
 Tyr Tyr Gly Leu Ser Ala Phe Gly Pro Val Ala Gln Pro Tyr Leu Trp
 180 185 190
 Trp Lys Lys His Met Thr Ala Ile Gln Leu Ile Gln Phe Val Leu Val
 195 200 205
 Ser Leu His Ile Ser Gln Tyr Tyr Phe Met Ser Ser Cys Asn Tyr Gln
 210 215 220
 Tyr Pro Val Ile Ile His Leu Ile Trp Met Tyr Gly Thr Ile Phe Phe
 225 230 235 240
 Met Leu Phe Ser Asn Phe Trp Tyr His Ser Tyr Thr Lys Gly Lys Arg
 245 250 255
 Leu Pro Arg Ala Leu Gln Gln Asn Gly Ala Pro Gly Ile Ala Lys Val
 260 265 270
 Lys Ala Asn Xaa
 275

<210> 37

<211> 219

<212> PRT

<213> Mortierella alpina

<400> 37

Leu Leu Leu Leu Phe Ile Glu Asn Leu Val Pro Ile Leu Ala Arg Asn
 1 5 10 15
 Gly Leu Phe Tyr Ala Ile Cys Asp Asp Gly Ala Trp Thr Gln Arg Leu
 20 25 30
 Glu Leu Leu Tyr Tyr Leu Asn Tyr Leu Val Lys Tyr Trp Glu Leu Ala
 35 40 45
 Asp Thr Val Phe Leu Val Leu Lys Lys Lys Pro Leu Glu Phe Leu His
 50 55 60
 Tyr Phe His His Ser Met Thr Met Val Leu Cys Phe Val Gln Leu Gly
 65 70 75 80
 Gly Tyr Thr Ser Val Ser Trp Val Pro Ile Thr Leu Asn Leu Thr Val
 85 90 95
 His Val Phe Met Tyr Tyr Tyr Tyr Met Arg Ser Ala Ala Gly Val Arg
 100 105 110
 Ile Trp Trp Lys Gln Tyr Leu Thr Thr Leu Gln Ile Val Gln Phe Val
 115 120 125
 Leu Asp Leu Gly Phe Ile Tyr Phe Cys Ala Tyr Thr Tyr Phe Ala Phe
 130 135 140
 Thr Tyr Phe Pro Trp Ala Pro Asn Val Gly Lys Cys Ala Gly Thr Glu
 145 150 155 160
 Gly Ala Ala Leu Phe Gly Cys Gly Leu Leu Ser Ser Tyr Leu Leu Leu
 165 170 175
 Phe Ile Asn Phe Tyr Arg Ile Thr Tyr Asn Ala Lys Ala Lys Ala Ala
 180 185 190
 Lys Glu Arg Gly Ser Asn Phe Thr Pro Lys Thr Val Lys Ser Gly Gly
 195 200 205

Ser Pro Lys Lys Pro Ser Lys Ser Lys His Ile
 210 215

<210> 38
 <211> 204
 <212> PRT
 <213> Mus musculus

<400> 38
 Ile Val Tyr Glu Phe Leu Met Ser Gly Trp Leu Ser Thr Tyr Thr Trp
 1 5 10 15
 Arg Cys Asp Pro Ile Asp Phe Ser Asn Ser Pro Glu Ala Leu Arg Met
 20 25 30
 Val Arg Val Ala Trp Leu Phe Met Leu Ser Lys Val Ile Glu Leu Met
 35 40 45
 Asp Thr Val Ile Phe Ile Leu Arg Lys Lys Asp Gly Gln Val Thr Phe
 50 55 60
 Leu His Val Phe His His Ser Val Leu Pro Trp Ser Trp Trp Trp Gly
 65 70 75 80
 Ile Lys Ile Ala Pro Gly Gly Met Gly Ser Phe His Ala Met Ile Asn
 85 90 95
 Ser Ser Val His Val Val Met Tyr Leu Tyr Tyr Gly Leu Ser Ala Leu
 100 105 110
 Gly Pro Val Ala Gln Pro Tyr Leu Trp Trp Lys Lys His Met Thr Ala
 115 120 125
 Ile Gln Leu Ile Gln Phe Val Leu Val Ser Leu His Ile Ser Gln Tyr
 130 135 140
 Tyr Phe Met Pro Ser Cys Asn Tyr Gln Tyr Pro Val Ile Ile His Leu
 145 150 155 160
 Ile Trp Met Tyr Gly Thr Ile Phe Phe Ile Leu Phe Ser Asn Phe Trp
 165 170 175
 Tyr His Ser Tyr Thr Lys Gly Lys Arg Leu Pro Arg Ala Val Gln Gln
 180 185 190
 Asn Gly Ala Pro Ala Thr Thr Lys Val Lys Ala Asn
 195 200

<210> 39
 <211> 174
 <212> PRT
 <213> Mortierella alpina

<400> 39
 Tyr Glu Leu Val Thr Gly Lys Ser Ile Asp Ser Phe Val Phe Gln Glu
 1 5 10 15
 Gly Val Thr Pro Leu Ser Thr Gln Arg Glu Val Ala Met Trp Thr Ile
 20 25 30
 Thr Tyr Phe Val Val Ile Phe Gly Gly Arg Gln Ile Met Lys Ser Gln
 35 40 45
 Asp Ala Phe Lys Leu Lys Pro Leu Phe Ile Leu His Asn Phe Leu Leu
 50 55 60
 Thr Ile Ala Ser Gly Ser Leu Leu Leu Phe Ile Glu Asn Leu Val
 65 70 75 80
 Pro Ile Leu Ala Arg Asn Gly Leu Phe Tyr Ala Ile Cys Asp Asp Gly
 85 90 95
 Ala Trp Thr Gln Arg Leu Glu Leu Leu Tyr Tyr Leu Asn Tyr Leu Val
 100 105 110
 Lys Tyr Trp Glu Leu Ala Asp Thr Val Phe Leu Val Leu Lys Lys Lys

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<210> 40
<211> 145
<212> PRT
<213> Mus musculus
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<210> 41
<211> 238
<212> PRT
<213> Mortierella alpina
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<400> 41															
Leu	Ile	Val	Leu	Ala	Tyr	Leu	Val	Thr	Val	Phe	Val	Gly	Met	Gln	Ile
1				5					10					15	
Met	Lys	Asn	Phe	Glu	Arg	Phe	Glu	Val	Lys	Thr	Phe	Ser	Leu	Leu	His
			20					25					30		
Asn	Phe	Cys	Leu	Val	Ser	Ile	Ser	Ala	Tyr	Met	Cys	Gly	Gly	Ile	Leu
		35					40					45			
Tyr	Glu	Ala	Tyr	Gln	Ala	Asn	Tyr	Gly	Leu	Phe	Glu	Asn	Ala	Ala	Asp
	50					55					60				
His	Thr	Phe	Lys	Gly	Leu	Pro	Met	Ala	Lys	Met	Ile	Trp	Leu	Phe	Tyr
65				70						75				80	
Phe	Ser	Lys	Ile	Met	Glu	Phe	Val	Asp	Thr	Met	Ile	Met	Val	Leu	Lys
				85					90					95	
Lys	Asn	Asn	Arg	Gln	Ile	Ser	Phe	Leu	His	Val	Tyr	His	His	Ser	Ser
			100					105					110		
Ile	Phe	Thr	Ile	Trp	Trp	Leu	Val	Thr	Phe	Val	Ala	Pro	Asn	Gly	Glu
		115					120					125			

Ala	Tyr	Phe	Ser	Ala	Ala	Leu	Asn	Ser	Phe	Ile	His	Val	Ile	Met	Tyr
130						135					140				
Gly	Tyr	Tyr	Phe	Leu	Ser	Ala	Leu	Gly	Phe	Lys	Gln	Val	Ser	Phe	Ile
145						150				155					160
Lys	Phe	Tyr	Ile	Thr	Arg	Ser	Gln	Met	Thr	Gln	Phe	Cys	Met	Met	Ser
				165					170					175	
Val	Gln	Ser	Ser	Trp	Asp	Met	Tyr	Ala	Met	Lys	Val	Leu	Gly	Arg	Pro
			180					185					190		
Gly	Tyr	Pro	Phe	Phe	Ile	Thr	Ala	Leu	Leu	Trp	Phe	Tyr	Met	Trp	Thr
		195					200					205			
Met	Leu	Gly	Leu	Phe	Tyr	Asn	Phe	Tyr	Arg	Lys	Asn	Ala	Lys	Leu	Ala
	210					215					220				
Lys	Gln	Ala	Lys	Ala	Asp	Ala	Ala	Lys	Glu	Lys	Ala	Arg	Lys		
225					230					235					

<210> 42

<211> 144

<212> PRT

<213> Homo sapiens

<400> 42

Leu	Tyr	Asn	Leu	Gly	Ile	Thr	Leu	Leu	Ser	Ala	Tyr	Met	Leu	Ala	Glu
1				5					10					15	
Leu	Ile	Leu	Ser	Thr	Trp	Glu	Gly	Gly	Tyr	Asn	Leu	Gln	Cys	Gln	Asp
			20					25					30		
Leu	Thr	Ser	Ala	Gly	Glu	Ala	Asp	Ile	Arg	Val	Ala	Lys	Val	Leu	Trp
		35					40					45			
Trp	Tyr	Tyr	Phe	Ser	Lys	Ser	Val	Glu	Phe	Leu	Asp	Thr	Ile	Phe	Phe
	50					55					60				
Val	Leu	Arg	Lys	Lys	Thr	Ser	Gln	Ile	Thr	Phe	Leu	His	Val	Tyr	His
65					70					75					80
His	Ala	Ser	Met	Phe	Asn	Ile	Trp	Trp	Cys	Val	Leu	Asn	Trp	Ile	Pro
				85					90					95	
Cys	Gly	Gln	Ser	Phe	Phe	Gly	Pro	Thr	Leu	Asn	Ser	Phe	Ile	His	Ile
			100					105					110		
Leu	Met	Tyr	Ser	Tyr	Tyr	Gly	Leu	Ser	Val	Phe	Pro	Ser	Met	His	Lys
		115				120						125			
Tyr	Leu	Trp	Trp	Lys	Lys	Tyr	Leu	Thr	Gln	Ala	Gln	Leu	Val	Gln	Phe
	130					135						140			

<210> 43

<211> 278

<212> PRT

<213> Mortierella alpina

<400> 43

Ala	Gln	Ala	Glu	Lys	Tyr	Ile	Pro	Thr	Ile	Val	His	His	Thr	Arg	Gly
1				5					10					15	
Phe	Leu	Val	Ala	Val	Glu	Ser	Pro	Leu	Ala	Arg	Glu	Leu	Pro	Leu	Met
			20					25					30		
Asn	Pro	Phe	His	Val	Leu	Leu	Ile	Val	Leu	Ala	Tyr	Leu	Val	Thr	Val
		35					40					45			
Phe	Val	Gly	Met	Gln	Ile	Met	Lys	Asn	Phe	Glu	Arg	Phe	Glu	Val	Lys
	50					55					60				
Thr	Phe	Ser	Leu	Leu	His	Asn	Phe	Cys	Leu	Val	Ser	Ile	Ser	Ala	Tyr
65					70					75					80
Met	Cys	Gly	Gly	Ile	Leu	Tyr	Glu	Ala	Tyr	Gln	Ala	Asn	Tyr	Gly	Leu

				85					90					95			
Phe	Glu	Asn	Ala	Ala	Asp	His	Thr	Phe	Lys	Gly	Leu	Pro	Met	Ala	Lys		
			100						105					110			
Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	Lys	Ile	Met	Glu	Phe	Val	Asp	Thr		
		115						120					125				
Met	Ile	Met	Val	Leu	Lys	Lys	Asn	Asn	Arg	Gln	Ile	Ser	Phe	Leu	His		
		130					135						140				
Val	Tyr	His	His	Ser	Ser	Ile	Phe	Thr	Ile	Trp	Trp	Leu	Val	Thr	Phe		
145						150					155					160	
Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	Phe	Ser	Ala	Ala	Leu	Asn	Ser	Phe		
				165					170						175		
Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	Tyr	Phe	Leu	Ser	Ala	Leu	Gly	Phe		
			180						185					190			
Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	Tyr	Ile	Thr	Arg	Ser	Gln	Met	Thr		
		195						200					205				
Gln	Phe	Cys	Met	Met	Ser	Val	Gln	Ser	Ser	Trp	Asp	Met	Tyr	Ala	Met		
		210					215					220					
Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	Pro	Phe	Phe	Ile	Thr	Ala	Leu	Leu		
225					230					235					240		
Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	Gly	Leu	Phe	Tyr	Asn	Phe	Tyr	Arg		
				245					250						255		
Lys	Asn	Ala	Lys	Leu	Ala	Lys	Gln	Ala	Lys	Ala	Asp	Ala	Ala	Lys	Glu		
			260					265						270			
Lys	Ala	Arg	Lys	Leu	Gln												
			275														

<210> 44

<211> 293

<212> PRT

<213> Homo sapiens

<400> 44

Met	Glu	His	Phe	Asp	Ala	Ser	Leu	Ser	Thr	Tyr	Phe	Lys	Ala	Leu	Leu		
1				5					10					15			
Gly	Pro	Arg	Asp	Thr	Arg	Val	Lys	Gly	Trp	Phe	Leu	Leu	Asp	Asn	Tyr		
			20					25					30				
Ile	Pro	Thr	Phe	Ile	Cys	Ser	Val	Ile	Tyr	Leu	Leu	Ile	Val	Trp	Leu		
		35					40					45					
Gly	Pro	Lys	Tyr	Met	Arg	Asn	Lys	Gln	Pro	Phe	Ser	Cys	Arg	Gly	Ile		
		50				55					60						
Leu	Val	Val	Tyr	Asn	Leu	Gly	Leu	Thr	Leu	Leu	Ser	Leu	Tyr	Met	Phe		
65					70					75					80		
Cys	Glu	Leu	Val	Thr	Gly	Val	Trp	Glu	Gly	Lys	Tyr	Asn	Phe	Phe	Cys		
				85					90					95			
Gln	Gly	Thr	Arg	Thr	Ala	Gly	Glu	Ser	Asp	Met	Lys	Ile	Ile	Arg	Val		
			100					105						110			
Leu	Trp	Trp	Tyr	Tyr	Phe	Ser	Lys	Leu	Ile	Glu	Phe	Met	Asp	Thr	Phe		
		115					120						125				
Phe	Phe	Ile	Leu	Arg	Lys	Asn	Asn	His	Gln	Ile	Thr	Val	Leu	His	Val		
		130				135						140					
Tyr	His	His	Ala	Ser	Met	Leu	Asn	Ile	Trp	Trp	Phe	Val	Met	Asn	Trp		
145					150					155					160		
Val	Pro	Cys	Gly	His	Ser	Tyr	Phe	Gly	Ala	Thr	Leu	Asn	Ser	Phe	Ile		
				165					170					175			
His	Val	Leu	Met	Tyr	Ser	Tyr	Tyr	Gly	Leu	Ser	Ser	Val	Pro	Ser	Met		
			180					185					190				
Arg	Pro	Tyr	Leu	Trp	Trp	Lys	Lys	Tyr	Ile	Thr	Gln	Gly	Gln	Leu	Leu		

[illegible]

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<210> 45
<211> 182
<212> PRT
<213> Mortierella alpina
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[illegible]

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<210> 46
<211> 141
<212> PRT
<213> Homo sapiens
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<220>  
<221> VARIANT  
<222> (141)...(141)  
<223> Xaa = Unknown or Other at position 141
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<400> 46
Asp Thr Ile Phe Ile Ile Leu Arg Lys Gln Lys Leu Ile Phe Leu His

1					5					10					15				
Trp	Tyr	His	His	Ile	Thr	Val	Leu	Leu	Tyr	Ser	Trp	Tyr	Ser	Tyr	Lys				
			20							25				30					
Asp	Met	Val	Ala	Gly	Gly	Gly	Trp	Phe	Met	Thr	Met	Asn	Tyr	Gly	Val				
			35							40				45					
His	Ala	Val	Met	Tyr	Ser	Tyr	Tyr	Ala	Leu	Arg	Ala	Ala	Gly	Phe	Arg				
			50							55				60					
Val	Ser	Arg	Lys	Phe	Ala	Met	Phe	Ile	Thr	Leu	Ser	Gln	Ile	Thr	Gln				
65							70				75				80				
Met	Leu	Met	Gly	Cys	Val	Val	Asn	Tyr	Leu	Val	Phe	Cys	Trp	Met	Gln				
									90				95						
His	Asp	Gln	Cys	His	Ser	His	Phe	Gln	Asn	Ile	Phe	Trp	Ser	Ser	Leu				
									105				110						
Met	Tyr	Leu	Ser	Tyr	Leu	Val	Leu	Phe	Cys	His	Phe	Phe	Phe	Glu	Ala				
									120				125						
Tyr	Ile	Gly	Lys	Met	Arg	Lys	Thr	Thr	Lys	Ala	Glu	Xaa							
									135				140						

<210> 47

$\langle 211 \rangle$ 241

<212> PRT

<213> Mortierella alpina

<400> 47

[illegible]

<210> 48
 <211> 217
 <212> PRT
 <213> Mus musculus

<400> 48
 Ile Val Tyr Asn Phe Ser Leu Val Ile Leu Ser Leu Tyr Ile Val Tyr
 1 5 10 15
 Glu Phe Leu Met Ser Gly Trp Leu Ser Thr Tyr Thr Trp Arg Cys Asp
 20 25 30
 Pro Ile Asp Phe Ser Asn Ser Pro Glu Ala Leu Arg Met Val Arg Val
 35 40 45
 Ala Trp Leu Phe Met Leu Ser Lys Val Ile Glu Leu Met Asp Thr Val
 50 55 60
 Ile Phe Ile Leu Arg Lys Lys Asp Gly Gln Val Thr Phe Leu His Val
 65 70 75 80
 Phe His His Ser Val Leu Pro Trp Ser Trp Trp Trp Gly Ile Lys Ile
 85 90 95
 Ala Pro Gly Gly Met Gly Ser Phe His Ala Met Ile Asn Ser Ser Val
 100 105 110
 His Val Val Met Tyr Leu Tyr Tyr Gly Leu Ser Ala Leu Gly Pro Val
 115 120 125
 Ala Gln Pro Tyr Leu Trp Trp Lys Lys His Met Thr Ala Ile Gln Leu
 130 135 140
 Ile Gln Phe Val Leu Val Ser Leu His Ile Ser Gln Tyr Tyr Phe Met
 145 150 155 160
 Pro Ser Cys Asn Tyr Gln Tyr Pro Val Ile Ile His Leu Ile Trp Met
 165 170 175
 Tyr Gly Thr Ile Phe Phe Ile Leu Phe Ser Asn Phe Trp Tyr His Ser
 180 185 190
 Tyr Thr Lys Gly Lys Arg Leu Pro Arg Ala Val Gln Gln Asn Gly Ala
 195 200 205
 Pro Ala Thr Thr Lys Val Lys Ala Asn
 210 215

<210> 49
 <211> 178
 <212> PRT
 <213> Mortierella alpina

<400> 49
 Pro Thr Ile Val His His Thr Arg Gly Phe Leu Val Ala Val Glu Ser
 1 5 10 15
 Pro Leu Ala Arg Glu Leu Pro Leu Met Asn Pro Phe His Val Leu Leu
 20 25 30
 Ile Val Leu Ala Tyr Leu Val Thr Val Phe Val Gly Met Gln Ile Met
 35 40 45
 Lys Asn Phe Glu Arg Phe Glu Val Lys Thr Phe Ser Leu Leu His Asn
 50 55 60
 Phe Cys Leu Val Ser Ile Ser Ala Tyr Met Cys Gly Gly Ile Leu Tyr
 65 70 75 80
 Glu Ala Tyr Gln Ala Asn Tyr Gly Leu Phe Glu Asn Ala Ala Asp His
 85 90 95
 Thr Phe Lys Gly Leu Pro Met Ala Lys Met Ile Trp Leu Phe Tyr Phe
 100 105 110
 Ser Lys Ile Met Glu Phe Val Asp Thr Met Ile Met Val Leu Lys Lys
 115 120 125

Asn Asn Arg Gln Ile Ser Phe Leu His Val Tyr His His Ser Ser Ile
 130 135 140
 Phe Thr Ile Trp Trp Leu Val Thr Phe Val Ala Pro Asn Gly Glu Ala
 145 150 155 160
 Tyr Phe Ser Ala Ala Leu Asn Ser Phe Ile His Val Ile Met Tyr Gly
 165 170 175
 Tyr Tyr

<210> 50
 <211> 148
 <212> PRT
 <213> Mus musculus

<400> 50
 Asn Glu Val Asn Ala Phe Leu Asp Asn Met Phe Gly Pro Arg Asp Ser
 1 5 10 15
 Arg Val Arg Gly Trp Phe Leu Leu Asp Ser Tyr Leu Pro Thr Phe Ile
 20 25 30
 Leu Thr Ile Thr Tyr Leu Leu Ser Ile Trp Leu Gly Asn Lys Tyr Met
 35 40 45
 Lys Asn Arg Pro Ala Leu Ser Leu Arg Gly Ile Leu Thr Leu Tyr Asn
 50 55 60
 Leu Ala Ile Thr Leu Leu Ser Ala Tyr Met Leu Val Glu Leu Ile Leu
 65 70 75 80
 Ser Ser Trp Glu Gly Tyr Asn Leu Gln Cys Gln Asn Leu Asp Ser
 85 90 95
 Ala Gly Glu Gly Asp Val Arg Val Ala Lys Val Leu Val Trp Tyr Tyr
 100 105 110
 Phe Ser Lys Leu Val Glu Phe Leu Asp Thr Ile Phe Phe Val Leu Arg
 115 120 125
 Lys Lys Ala Asn Gln Ile Thr Phe Leu His Val Tyr His His Ala Ser
 130 135 140
 Met Phe Asn Ile
 145

<210> 51
 <211> 302
 <212> PRT
 <213> Mortierella alpina

<400> 51
 Phe Met Asp Leu Ala Thr Ala Ile Gly Val Arg Ala Ala Pro Tyr Val
 1 5 10 15
 Asp Pro Leu Glu Ala Ala Leu Val Ala Gln Ala Glu Lys Tyr Ile Pro
 20 25 30
 Thr Ile Val His His Thr Arg Gly Phe Leu Val Ala Val Glu Ser Pro
 35 40 45
 Leu Ala Arg Glu Leu Pro Leu Met Asn Pro Phe His Val Leu Leu Ile
 50 55 60
 Val Leu Ala Tyr Leu Val Thr Val Phe Val Gly Met Gln Ile Met Lys
 65 70 75 80
 Asn Phe Glu Arg Phe Glu Val Lys Thr Phe Ser Leu Leu His Asn Phe
 85 90 95
 Cys Leu Val Ser Ile Ser Ala Tyr Met Cys Gly Gly Ile Leu Tyr Glu
 100 105 110
 Ala Tyr Gln Ala Asn Tyr Gly Leu Phe Glu Asn Ala Ala Asp His Thr

		115					120					125				
Phe	Lys	Gly	Leu	Pro	Met	Ala	Lys	Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	
		130				135					140					
Lys	Ile	Met	Glu	Phe	Val	Asp	Thr	Met	Ile	Met	Val	Leu	Lys	Lys	Asn	
145					150					155					160	
Asn	Arg	Gln	Ile	Ser	Phe	Leu	His	Val	Tyr	His	His	Ser	Ser	Ile	Phe	
				165					170					175		
Thr	Ile	Trp	Trp	Leu	Val	Thr	Phe	Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	
			180					185					190			
Phe	Ser	Ala	Ala	Leu	Asn	Ser	Phe	Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	
		195				200						205				
Tyr	Phe	Leu	Ser	Ala	Leu	Gly	Phe	Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	
		210				215					220					
Tyr	Ile	Thr	Arg	Ser	Gln	Met	Thr	Gln	Phe	Cys	Met	Met	Ser	Val	Gln	
225					230					235					240	
Ser	Ser	Trp	Asp	Met	Tyr	Ala	Met	Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	
				245					250					255		
Pro	Phe	Phe	Ile	Thr	Ala	Leu	Leu	Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	
			260					265					270			
Gly	Leu	Phe	Tyr	Asn	Phe	Tyr	Arg	Lys	Asn	Ala	Lys	Leu	Ala	Lys	Gln	
		275					280					285				
Ala	Lys	Ala	Asp	Ala	Ala	Lys	Glu	Lys	Ala	Arg	Lys	Leu	Gln			
		290				295					300					

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<210> 52
<211> 271
<212> PRT
<213> Mus musculus
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<400> 52

Met 1	Asp	Thr	Ser	Met 5	Asn	Phe	Ser	Arg	Gly 10	Leu	Lys	Met	Asp	Leu 15	Met
Gln	Pro	Tyr	Asp	Phe	Glu	Thr	Phe	Gln	Asp	Leu	Arg	Pro	Phe	Leu	Glu
			20					25					30		
Glu	Tyr	Trp	Val	Ser	Ser	Phe	Leu	Ile	Val	Val	Val	Tyr	Leu	Leu	Leu
		35					40					45			
Ile	Val	Val	Gly	Gln	Thr	Tyr	Met	Arg	Thr	Arg	Lys	Ser	Phe	Ser	Leu
	50					55					60				
Gln	Arg	Pro	Leu	Ile	Leu	Trp	Ser	Phe	Phe	Leu	Ala	Ile	Phe	Ser	Ile
65					70					75					80
Leu	Gly	Thr	Leu	Arg	Met	Trp	Lys	Phe	Met	Ala	Thr	Val	Met	Phe	Thr
				85					90					95	
Val	Gly	Leu	Lys	Gln	Thr	Val	Cys	Phe	Ala	Ile	Tyr	Thr	Asp	Asp	Ala
			100					105					110		
Val	Val	Arg	Phe	Trp	Ser	Phe	Leu	Phe	Leu	Leu	Ser	Lys	Val	Val	Glu
		115					120					125			
Leu	Gly	Asp	Thr	Ala	Phe	Ile	Ile	Leu	Arg	Lys	Arg	Pro	Leu	Ile	Phe
		130				135					140				
Val	His	Trp	Tyr	His	His	Ser	Thr	Val	Leu	Leu	Phe	Thr	Ser	Phe	Gly
145				150						155					160
Tyr	Lys	Asn	Lys	Val	Pro	Ser	Gly	Gly	Trp	Phe	Met	Thr	Met	Asn	Phe
			165						170					175	
Gly	Val	His	Ser	Val	Met	Tyr	Thr	Tyr	Tyr	Thr	Met	Lys	Ala	Ala	Lys
			180					185					190		
Leu	Lys	His	Pro	Asn	Leu	Leu	Pro	Met	Val	Ile	Thr	Ser	Leu	Gln	Ile
		195					200					205			
Leu	Gln	Met	Val	Leu	Gly	Thr	Ile	Phe	Gly	Ile	Leu	Asn	Tyr	Ile	Trp

210						215						220					
Arg	Gln	Glu	Lys	Gly	Cys	His	Thr	Thr	Thr	Glu	His	Phe	Phe	Trp	Ser		
225					230					235					240		
Phe	Met	Leu	Tyr	Gly	Thr	Tyr	Phe	Ile	Leu	Phe	Ala	His	Phe	Phe	His		
				245					250					255			
Arg	Ala	Tyr	Leu	Arg	Pro	Lys	Gly	Lys	Val	Ala	Ser	Lys	Ser	Gln			
			260					265					270				

<210> 53
 <211> 265
 <212> PRT
 <213> Mortierella alpina

<400> 53																	
Thr	Arg	Gly	Phe	Leu	Val	Ala	Val	Glu	Ser	Pro	Leu	Ala	Arg	Glu	Leu		
1				5				10						15			
Pro	Leu	Met	Asn	Pro	Phe	His	Val	Leu	Ile	Val	Leu	Ala	Tyr	Leu			
			20					25					30				
Val	Thr	Val	Phe	Val	Gly	Met	Gln	Ile	Met	Lys	Asn	Phe	Glu	Arg	Phe		
		35					40					45					
Glu	Val	Lys	Thr	Phe	Ser	Leu	Leu	His	Asn	Phe	Cys	Leu	Val	Ser	Ile		
	50					55				60							
Ser	Ala	Tyr	Met	Cys	Gly	Gly	Ile	Leu	Tyr	Glu	Ala	Tyr	Gln	Ala	Asn		
65					70				75						80		
Tyr	Gly	Leu	Phe	Glu	Asn	Ala	Ala	Asp	His	Thr	Phe	Lys	Gly	Leu	Pro		
				85				90						95			
Met	Ala	Lys	Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	Lys	Ile	Met	Glu	Phe		
		100						105					110				
Val	Asp	Thr	Met	Ile	Met	Val	Leu	Lys	Lys	Asn	Asn	Arg	Gln	Ile	Ser		
	115						120					125					
Phe	Leu	His	Val	Tyr	His	His	Ser	Ser	Ile	Phe	Thr	Ile	Trp	Trp	Leu		
	130					135					140						
Val	Thr	Phe	Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	Phe	Ser	Ala	Ala	Leu		
145					150				155						160		
Asn	Ser	Phe	Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	Tyr	Phe	Leu	Ser	Ala		
				165				170						175			
Leu	Gly	Phe	Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	Tyr	Ile	Thr	Arg	Ser		
			180					185					190				
Gln	Met	Thr	Gln	Phe	Cys	Met	Met	Ser	Val	Gln	Ser	Ser	Trp	Asp	Met		
	195					200					205						
Tyr	Ala	Met	Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	Pro	Phe	Phe	Ile	Thr		
	210					215				220							
Ala	Leu	Leu	Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	Gly	Leu	Phe	Tyr	Asn		
225					230				235						240		
Phe	Tyr	Arg	Lys	Asn	Ala	Lys	Leu	Ala	Lys	Gln	Ala	Lys	Ala	Asp	Ala		
			245					250						255			
Ala	Lys	Glu	Lys	Ala	Arg	Lys	Leu	Gln									
			260					265									

<210> 54
 <211> 265
 <212> PRT
 <213> Caenorhabditis elegans

<400> 54																	
Ala	Thr	His	Gly	Pro	Lys	Asn	Phe	Pro	Asp	Ala	Glu	Gly	Arg	Lys	Phe		
1				5				10						15			

Phe	Ala	Asp	His	Phe	Asp	Val	Thr	Ile	Gln	Ala	Ser	Ile	Leu	Tyr	Met		
			20					25					30				
Val	Val	Val	Phe	Gly	Thr	Lys	Trp	Phe	Met	Arg	Asn	Arg	Gln	Pro	Phe		
		35					40					45					
Gln	Leu	Thr	Ile	Pro	Leu	Asn	Ile	Trp	Asn	Phe	Ile	Leu	Ala	Ala	Phe		
	50					55				60							
Ser	Ile	Ala	Gly	Ala	Val	Lys	Met	Thr	Pro	Glu	Phe	Phe	Gly	Thr	Ile		
65					70					75					80		
Ala	Asn	Lys	Gly	Ile	Val	Ala	Ser	Tyr	Cys	Lys	Val	Phe	Asp	Phe	Thr		
			85						90					95			
Lys	Gly	Glu	Asn	Gly	Tyr	Trp	Val	Trp	Leu	Phe	Met	Ala	Ser	Lys	Leu		
			100					105						110			
Phe	Glu	Leu	Val	Asp	Thr	Ile	Phe	Leu	Val	Leu	Arg	Lys	Arg	Pro	Leu		
		115					120					125					
Met	Phe	Leu	His	Trp	Tyr	His	His	Ile	Leu	Thr	Met	Ile	Tyr	Ala	Trp		
	130					135					140						
Tyr	Ser	His	Pro	Leu	Thr	Pro	Gly	Phe	Asn	Arg	Tyr	Gly	Ile	Tyr	Leu		
145					150					155					160		
Asn	Phe	Val	Val	His	Ala	Phe	Met	Tyr	Ser	Tyr	Tyr	Phe	Leu	Arg	Ser		
			165						170					175			
Met	Lys	Ile	Arg	Val	Pro	Gly	Phe	Ile	Ala	Gln	Ala	Ile	Thr	Ser	Leu		
			180					185						190			
Gln	Ile	Val	Gln	Phe	Ile	Ile	Ser	Cys	Ala	Val	Leu	Ala	His	Leu	Gly		
	195						200					205					
Tyr	Leu	Met	His	Phe	Thr	Asn	Ala	Asn	Cys	Asp	Phe	Glu	Pro	Ser	Val		
	210					215					220						
Phe	Lys	Leu	Ala	Val	Phe	Met	Asp	Thr	Thr	Tyr	Leu	Ala	Leu	Phe	Val		
225					230					235					240		
Asn	Phe	Phe	Leu	Gln	Ser	Tyr	Val	Leu	Arg	Gly	Gly	Lys	Asp	Lys	Tyr		
			245						250					255			
Lys	Ala	Val	Pro	Lys	Lys	Lys	Asn	Asn									
			260					265									

<210> 55

<211> 288

<212> PRT

<213> Caenorhabditis elegans

<400> 55

Met	Ala	Gln	His	Pro	Leu	Val	Gln	Arg	Leu	Leu	Asp	Val	Lys	Phe	Asp		
1				5					10					15			
Thr	Lys	Arg	Phe	Val	Ala	Ile	Ala	Thr	His	Gly	Pro	Lys	Asn	Phe	Pro		
			20					25					30				
Asp	Ala	Glu	Gly	Arg	Lys	Phe	Phe	Ala	Asp	His	Phe	Asp	Val	Thr	Ile		
	35					40					45						
Gln	Ala	Ser	Ile	Leu	Tyr	Met	Val	Val	Val	Phe	Gly	Thr	Lys	Trp	Phe		
	50					55				60							
Met	Arg	Asn	Arg	Gln	Pro	Phe	Gln	Leu	Thr	Ile	Pro	Leu	Asn	Ile	Trp		
65				70						75				80			
Asn	Phe	Ile	Leu	Ala	Ala	Phe	Ser	Ile	Ala	Gly	Ala	Val	Lys	Met	Thr		
			85						90					95			
Pro	Glu	Phe	Phe	Gly	Thr	Ile	Ala	Asn	Lys	Gly	Ile	Val	Ala	Ser	Tyr		
			100					105					110				
Cys	Lys	Val	Phe	Asp	Phe	Thr	Lys	Gly	Glu	Asn	Gly	Tyr	Trp	Val	Trp		
		115					120					125					
Leu	Phe	Met	Ala	Ser	Lys	Leu	Phe	Glu	Leu	Val	Asp	Thr	Ile	Phe	Leu		
	130						135					140					

Val	Leu	Arg	Lys	Arg	Pro	Leu	Met	Phe	Leu	His	Trp	Tyr	His	His	Ile
145					150					155					160
Leu	Thr	Met	Ile	Tyr	Ala	Trp	Tyr	Ser	His	Pro	Leu	Thr	Pro	Gly	Phe
				165					170					175	
Asn	Arg	Tyr	Gly	Ile	Tyr	Leu	Asn	Phe	Val	Val	His	Ala	Phe	Met	Tyr
			180					185					190		
Ser	Tyr	Tyr	Phe	Leu	Arg	Ser	Met	Lys	Ile	Arg	Val	Pro	Gly	Phe	Ile
		195					200					205			
Ala	Gln	Ala	Ile	Thr	Ser	Leu	Gln	Ile	Val	Gln	Phe	Ile	Ile	Ser	Cys
	210					215					220				
Ala	Val	Leu	Ala	His	Leu	Gly	Tyr	Leu	Met	His	Phe	Thr	Asn	Ala	Asn
225					230					235					240
Cys	Asp	Phe	Glu	Pro	Ser	Val	Phe	Lys	Leu	Ala	Val	Phe	Met	Asp	Thr
			245					250					255		
Thr	Tyr	Leu	Ala	Leu	Phe	Val	Asn	Phe	Phe	Leu	Gln	Ser	Tyr	Val	Leu
		260					265						270		
Arg	Gly	Gly	Lys	Asp	Lys	Tyr	Lys	Ala	Val	Pro	Lys	Lys	Lys	Asn	Asn
		275					280					285			

<210> 56

<211> 282

<212> PRT

<213> Mortierella alpina

<400> 56

Ala	Ala	Leu	Val	Ala	Gln	Ala	Glu	Lys	Tyr	Ile	Pro	Thr	Ile	Val	His
1				5					10					15	
His	Thr	Arg	Gly	Phe	Leu	Val	Ala	Val	Glu	Ser	Pro	Leu	Ala	Arg	Glu
			20					25					30		
Leu	Pro	Leu	Met	Asn	Pro	Phe	His	Val	Leu	Leu	Ile	Val	Leu	Ala	Tyr
		35					40					45			
Leu	Val	Thr	Val	Phe	Val	Gly	Met	Gln	Ile	Met	Lys	Asn	Phe	Glu	Arg
	50					55					60				
Phe	Glu	Val	Lys	Thr	Phe	Ser	Leu	Leu	His	Asn	Phe	Cys	Leu	Val	Ser
65					70					75					80
Ile	Ser	Ala	Tyr	Met	Cys	Gly	Gly	Ile	Leu	Tyr	Glu	Ala	Tyr	Gln	Ala
			85					90						95	
Asn	Tyr	Gly	Leu	Phe	Glu	Asn	Ala	Ala	Asp	His	Thr	Phe	Lys	Gly	Leu
			100					105					110		
Pro	Met	Ala	Lys	Met	Ile	Trp	Leu	Phe	Tyr	Phe	Ser	Lys	Ile	Met	Glu
		115					120					125			
Phe	Val	Asp	Thr	Met	Ile	Met	Val	Leu	Lys	Lys	Asn	Asn	Arg	Gln	Ile
	130					135					140				
Ser	Phe	Leu	His	Val	Tyr	His	His	Ser	Ser	Ile	Phe	Thr	Ile	Trp	Trp
145					150					155					160
Leu	Val	Thr	Phe	Val	Ala	Pro	Asn	Gly	Glu	Ala	Tyr	Phe	Ser	Ala	Ala
			165						170					175	
Leu	Asn	Ser	Phe	Ile	His	Val	Ile	Met	Tyr	Gly	Tyr	Tyr	Phe	Leu	Ser
			180					185					190		
Ala	Leu	Gly	Phe	Lys	Gln	Val	Ser	Phe	Ile	Lys	Phe	Tyr	Ile	Thr	Arg
		195					200					205			
Ser	Gln	Met	Thr	Gln	Phe	Cys	Met	Met	Ser	Val	Gln	Ser	Ser	Trp	Asp
	210					215					220				
Met	Tyr	Ala	Met	Lys	Val	Leu	Gly	Arg	Pro	Gly	Tyr	Pro	Phe	Phe	Ile
225					230					235					240
Thr	Ala	Leu	Leu	Trp	Phe	Tyr	Met	Trp	Thr	Met	Leu	Gly	Leu	Phe	Tyr
			245						250					255	

Asn Phe Tyr Arg Lys Asn Ala Lys Leu Ala Lys Gln Ala Lys Ala Asp
 260 265 270
 Ala Ala Lys Glu Lys Ala Arg Lys Leu Gln
 275 280

<210> 57

<211> 278

<212> PRT

<213> *Drosophila melanogaster*

<220>

<221> VARIANT

<222> (235)...(235)

<223> Xaa = Unknown or Other at position 235

<400> 57

Pro Thr Lys Met Ile Asn Met Asp Ile Ser Val Thr Pro Asn Tyr Ser
 1 5 10 15
 Tyr Ile Phe Asp Phe Glu Asn Asp Phe Ile His Gln Arg Thr Arg Lys
 20 25 30
 Trp Met Leu Glu Asn Trp Thr Trp Val Phe Tyr Tyr Cys Gly Ile Tyr
 35 40 45
 Met Leu Val Ile Phe Gly Gly Gln His Phe Met Gln Asn Arg Pro Arg
 50 55 60
 Phe Gln Leu Arg Gly Pro Leu Ile Ile Trp Asn Thr Leu Leu Ala Met
 65 70 75 80
 Phe Ser Ile Met Gly Ala Ala Arg Thr Ala Pro Glu Leu Ile His Val
 85 90 95
 Leu Arg His Tyr Gly Leu Phe His Ser Val Cys Val Pro Ser Tyr Ile
 100 105 110
 Glu Gln Asp Arg Val Cys Gly Phe Trp Thr Trp Leu Phe Val Leu Ser
 115 120 125
 Lys Leu Pro Glu Leu Gly Asp Thr Ile Phe Ile Val Leu Arg Lys Gln
 130 135 140
 Pro Leu Ile Phe Leu His Trp Tyr His His Ile Thr Val Leu Ile Tyr
 145 150 155 160
 Ser Trp Phe Ser Tyr Thr Glu Tyr Thr Ser Ser Ala Arg Trp Phe Ile
 165 170 175
 Val Met Asn Tyr Cys Val His Ser Val Met Tyr Ser Tyr Tyr Ala Leu
 180 185 190
 Lys Ala Ala Arg Phe Asn Pro Pro Arg Phe Ile Ser Met Ile Ile Thr
 195 200 205
 Ser Leu Gln Leu Ala Gln Met Ile Ile Gly Cys Ala Ile Asn Val Trp
 210 215 220
 Ala Asn Gly Phe Leu Lys Thr His Gly Thr Xaa Ser Cys His Ile Ser
 225 230 235 240
 Gln Arg Asn Ile Asn Leu Ser Ile Ala Met Tyr Ser Ser Tyr Phe Val
 245 250 255
 Leu Phe Ala Arg Phe Phe Tyr Lys Ala Tyr Leu Ala Pro Gly Gly His
 260 265 270
 Lys Ser Arg Arg Met Ala
 275

<210> 58

<211> 286

<212> PRT

<213> *Mortierella alpina*

<400> 58

Val	Thr	Gly	Lys	Ser	Ile	Asp	Ser	Phe	Val	Phe	Gln	Glu	Gly	Val	Thr
1				5					10					15	
Pro	Leu	Ser	Thr	Gln	Arg	Glu	Val	Ala	Met	Trp	Thr	Ile	Thr	Tyr	Phe
			20					25					30		
Val	Val	Ile	Phe	Gly	Gly	Arg	Gln	Ile	Met	Lys	Ser	Gln	Asp	Ala	Phe
		35					40					45			
Lys	Leu	Lys	Pro	Leu	Phe	Ile	Leu	His	Asn	Phe	Leu	Leu	Thr	Ile	Ala
	50					55					60				
Ser	Gly	Ser	Leu	Leu	Leu	Leu	Phe	Ile	Glu	Asn	Leu	Val	Pro	Ile	Leu
65				70						75					80
Ala	Arg	Asn	Gly	Leu	Phe	Tyr	Ala	Ile	Cys	Asp	Asp	Gly	Ala	Trp	Thr
			85						90					95	
Gln	Arg	Leu	Glu	Leu	Leu	Tyr	Tyr	Leu	Asn	Tyr	Leu	Val	Lys	Tyr	Trp
			100					105					110		
Glu	Leu	Ala	Asp	Thr	Val	Phe	Leu	Val	Leu	Lys	Lys	Lys	Pro	Leu	Glu
		115					120					125			
Phe	Leu	His	Tyr	Phe	His	His	Ser	Met	Thr	Met	Val	Leu	Cys	Phe	Val
	130					135					140				
Gln	Leu	Gly	Gly	Tyr	Thr	Ser	Val	Ser	Trp	Val	Pro	Ile	Thr	Leu	Asn
145					150					155					160
Leu	Thr	Val	His	Val	Phe	Met	Tyr	Tyr	Tyr	Tyr	Met	Arg	Ser	Ala	Ala
			165						170					175	
Gly	Val	Arg	Ile	Trp	Trp	Lys	Gln	Tyr	Leu	Thr	Thr	Leu	Gln	Ile	Val
			180					185					190		
Gln	Phe	Val	Leu	Asp	Leu	Gly	Phe	Ile	Tyr	Phe	Cys	Ala	Tyr	Thr	Tyr
		195					200					205			
Phe	Ala	Phe	Thr	Tyr	Phe	Pro	Trp	Ala	Pro	Asn	Val	Gly	Lys	Cys	Ala
	210					215					220				
Gly	Thr	Glu	Gly	Ala	Ala	Leu	Phe	Gly	Cys	Gly	Leu	Leu	Ser	Ser	Tyr
225					230					235					240
Leu	Leu	Leu	Phe	Ile	Asn	Phe	Tyr	Arg	Ile	Thr	Tyr	Asn	Ala	Lys	Ala
			245						250					255	
Lys	Ala	Ala	Lys	Glu	Arg	Gly	Ser	Asn	Phe	Thr	Pro	Lys	Thr	Val	Lys
			260					265					270		
Ser	Gly	Gly	Ser	Pro	Lys	Lys	Pro	Ser	Lys	Ser	Lys	His	Ile		
		275					280					285			

<210> 59

<211> 261

<212> PRT

<213> *Drosophila melanogaster*

<220>

<221> VARIANT

<222> (218)...(218)

<223> Xaa = Unknown or Other at position 218

<400> 59

Ile	Phe	Asp	Phe	Glu	Asn	Asp	Phe	Ile	His	Gln	Arg	Thr	Arg	Lys	Trp
1				5					10					15	
Met	Leu	Glu	Asn	Trp	Thr	Trp	Val	Phe	Tyr	Tyr	Cys	Gly	Ile	Tyr	Met
			20					25					30		
Leu	Val	Ile	Phe	Gly	Gly	Gln	His	Phe	Met	Gln	Asn	Arg	Pro	Arg	Phe
		35					40					45			
Gln	Leu	Arg	Gly	Pro	Leu	Ile	Ile	Trp	Asn	Thr	Leu	Leu	Ala	Met	Phe

50	55	60
Ser Ile Met Gly Ala	Ala Arg Thr Ala Pro Glu Leu Ile His Val Leu	
65	70	75
Arg His Tyr Gly Leu Phe His Ser Val Cys Val Pro Ser Tyr Ile Glu		80
	85	90
Gln Asp Arg Val Cys Gly Phe Trp Thr Trp Leu Phe Val Leu Ser Lys		95
	100	105
Leu Pro Glu Leu Gly Asp Thr Ile Phe Ile Val Leu Arg Lys Gln Pro		110
	115	120
Leu Ile Phe Leu His Trp Tyr His His Ile Thr Val Leu Ile Tyr Ser		125
	130	135
Trp Phe Ser Tyr Thr Glu Tyr Thr Ser Ser Ala Arg Trp Phe Ile Val		140
145	150	155
Met Asn Tyr Cys Val His Ser Val Met Tyr Ser Tyr Tyr Ala Leu Lys		160
	165	170
Ala Ala Arg Phe Asn Pro Pro Arg Phe Ile Ser Met Ile Ile Thr Ser		175
	180	185
Leu Gln Leu Ala Gln Met Ile Ile Gly Cys Ala Ile Asn Val Trp Ala		190
	195	200
Asn Gly Phe Leu Lys Thr His Gly Thr Xaa Ser Cys His Ile Ser Gln		205
	210	215
Arg Asn Ile Asn Leu Ser Ile Ala Met Tyr Ser Ser Tyr Phe Val Leu		220
225	230	235
Phe Ala Arg Phe Phe Tyr Lys Ala Tyr Leu Ala Pro Gly Gly His Lys		240
	245	250
Ser Arg Arg Met Ala		255
	260	

<210> 60

<211> 299

<212> PRT

<213> Homo sapiens

<400> 60

Met Glu His Phe Asp Ala Ser Leu Ser Thr Tyr Phe Lys Ala Leu Leu	
1	5
Gly Pro Arg Asp Thr Arg Val Lys Gly Trp Phe Leu Leu Asp Asn Tyr	
	20
Ile Pro Thr Phe Ile Cys Ser Val Ile Tyr Leu Leu Ile Val Trp Leu	
	35
Gly Pro Lys Tyr Met Arg Asn Lys Gln Pro Phe Ser Cys Arg Gly Ile	
	50
Leu Val Val Tyr Asn Leu Gly Leu Thr Leu Leu Ser Leu Tyr Met Phe	
65	70
Cys Glu Leu Val Thr Gly Val Trp Glu Gly Lys Tyr Asn Phe Phe Cys	
	85
Gln Gly Thr Arg Thr Ala Gly Glu Ser Asp Met Lys Ile Ile Arg Val	
	100
Leu Trp Trp Tyr Tyr Phe Ser Lys Leu Ile Glu Phe Met Asp Thr Phe	
	115
Phe Phe Ile Leu Arg Lys Asn Asn His Gln Ile Thr Val Leu His Val	
	130
Tyr His His Ala Ser Met Leu Asn Ile Trp Trp Phe Val Met Asn Trp	
145	150
Val Pro Cys Gly His Ser Tyr Phe Gly Ala Thr Leu Asn Ser Phe Ile	
	165
His Val Leu Met Tyr Ser Tyr Tyr Gly Leu Ser Ser Val Pro Ser Met	
	170
	175

			180					185					190		
Arg	Pro	Tyr	Leu	Trp	Trp	Lys	Lys	Tyr	Ile	Thr	Gln	Gly	Gln	Leu	Leu
		195					200					205			
Gln	Phe	Val	Leu	Thr	Ile	Ile	Gln	Thr	Ser	Cys	Gly	Val	Ile	Trp	Pro
	210					215					220				
Cys	Thr	Phe	Pro	Leu	Gly	Trp	Leu	Tyr	Phe	Gln	Ile	Gly	Tyr	Ile	Ile
225					230					235					240
Ser	Leu	Ile	Ala	Leu	Phe	Thr	Asn	Phe	Tyr	Ile	Gln	Thr	Tyr	Asn	Lys
				245					250					255	
Lys	Gly	Ala	Ser	Arg	Arg	Lys	Asp	His	Leu	Lys	Asp	His	Gln	Asn	Gly
			260					265					270		
Ser	Val	Ala	Ala	Val	Asn	Gly	His	Thr	Asn	Ser	Phe	Ser	Pro	Leu	Glu
		275					280					285			
Asn	Asn	Val	Lys	Pro	Arg	Lys	Leu	Arg	Lys	Asp					
	290					295									

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<210> 61
<211> 798
<212> DNA
<213> Homo sapiens
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<400>	61						
atgaacatgt	cagtgttgac	tttacaagaa	tatgaattcg	aaaagcagtt	caacgagaat		60
gaagccatcc	aatggatgca	ggaaaactgg	aagaaatctt	tcctgttttc	tgctctgtat		120
gctgccttta	tattcggtg	tcggcaccta	atgaataaac	gagcaaagtt	tgaactgagg		180
aagccattag	tgctctggtc	tctgacctt	gcagtcttca	gtatatctcg	tgctcttcga		240
actggtgctt	atatggtgta	cattttgatg	accaaaggcc	tgaagcagtc	agttttgtgac		300
cagggttttt	acaatggacc	tgtcagcaaa	ttctgggctt	atgcattttg	gctaagcaaa		360
gcaccogaac	taggagatac	aatattcatt	attctgagga	agcagaagct	gatcttctctg		420
cactgggtatc	accacatcac	tgtgctcctg	tactcttggt	actcctacaa	agacatgggtt		480
gccgggggag	gttggttcat	gactatgaac	tatggcgtgc	acgccgtgat	gtactcttac		540
tatgccttgc	ggcgggcagg	tttccgagtc	tcccggaaagt	ttgccatgtt	catcaccttg		600
tcccagatca	ctcagatgct	gatgggctgt	gtgggttaact	acctgggtctt	ctgctggatg		660
cagcatgacc	agtgtcactc	tcacttttcag	aacatcttct	ggctctcact	catgtacctc		720
agctaccttg	tgctcttctg	ccatttcttc	tttgaggcct	acatcggcaa	aatgaggaaa		780
acaacqaaaq	ctqaataq						798

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<210> 62
<211> 265
<212> PRT
<213> Homo sapiens
```

<400> 62															
Met	Asn	Met	Ser	Val	Leu	Thr	Leu	Gln	Glu	Tyr	Glu	Phe	Glu	Lys	Gln
1				5					10					15	
Phe	Asn	Glu	Asn	Glu	Ala	Ile	Gln	Trp	Met	Gln	Glu	Asn	Trp	Lys	Lys
			20					25					30		
Ser	Phe	Leu	Phe	Ser	Ala	Leu	Tyr	Ala	Ala	Phe	Ile	Phe	Gly	Gly	Arg
		35					40					45			
His	Leu	Met	Asn	Lys	Arg	Ala	Lys	Phe	Glu	Leu	Arg	Lys	Pro	Leu	Val
	50					55					60				
Leu	Trp	Ser	Leu	Thr	Leu	Ala	Val	Phe	Ser	Ile	Phe	Gly	Ala	Leu	Arg
65					70					75				80	
Thr	Gly	Ala	Tyr	Met	Val	Tyr	Ile	Leu	Met	Thr	Lys	Gly	Leu	Lys	Gln
				85					90					95	
Ser	Val	Cys	Asp	Gln	Gly	Phe	Tyr	Asn	Gly	Pro	Val	Ser	Lys	Phe	Trp
			100					105					110		

Ala	Tyr	Ala	Phe	Val	Leu	Ser	Lys	Ala	Pro	Glu	Leu	Gly	Asp	Thr	Ile		
		115					120					125					
Phe	Ile	Ile	Leu	Arg	Lys	Gln	Lys	Leu	Ile	Phe	Leu	His	Trp	Tyr	His		
	130					135					140						
His	Ile	Thr	Val	Leu	Leu	Tyr	Ser	Trp	Tyr	Ser	Tyr	Lys	Asp	Met	Val		
145					150					155					160		
Ala	Gly	Gly	Gly	Trp	Phe	Met	Thr	Met	Asn	Tyr	Gly	Val	His	Ala	Val		
				165					170						175		
Met	Tyr	Ser	Tyr	Tyr	Ala	Leu	Arg	Ala	Ala	Gly	Phe	Arg	Val	Ser	Arg		
			180					185						190			
Lys	Phe	Ala	Met	Phe	Ile	Thr	Leu	Ser	Gln	Ile	Thr	Gln	Met	Leu	Met		
		195					200					205					
Gly	Cys	Val	Val	Asn	Tyr	Leu	Val	Phe	Cys	Trp	Met	Gln	His	Asp	Gln		
	210					215					220						
Cys	His	Ser	His	Phe	Gln	Asn	Ile	Phe	Trp	Ser	Ser	Leu	Met	Tyr	Leu		
225					230					235					240		
Ser	Tyr	Leu	Val	Leu	Phe	Cys	His	Phe	Phe	Phe	Glu	Ala	Tyr	Ile	Gly		
				245					250					255			
Lys	Met	Arg	Lys	Thr	Thr	Lys	Ala	Glu									
			260					265									

<210> 63

<211> 292

<212> PRT

<213> Mus musculus

<400> 63

Met	Glu	Gln	Leu	Lys	Ala	Phe	Asp	Asn	Glu	Val	Asn	Ala	Phe	Leu	Asp		
1				5					10					15			
Asn	Met	Phe	Gly	Pro	Arg	Asp	Ser	Arg	Val	Arg	Gly	Trp	Phe	Leu	Leu		
		20						25					30				
Asp	Ser	Tyr	Leu	Pro	Thr	Phe	Ile	Leu	Thr	Ile	Thr	Tyr	Leu	Leu	Ser		
		35					40					45					
Ile	Trp	Leu	Gly	Asn	Lys	Tyr	Met	Lys	Asn	Arg	Pro	Ala	Leu	Ser	Leu		
	50					55					60						
Arg	Gly	Ile	Leu	Thr	Leu	Tyr	Asn	Leu	Ala	Ile	Thr	Leu	Leu	Ser	Ala		
65					70					75					80		
Tyr	Met	Leu	Val	Glu	Leu	Ile	Leu	Ser	Ser	Trp	Glu	Gly	Gly	Tyr	Asn		
				85				90						95			
Leu	Gln	Cys	Gln	Asn	Leu	Asp	Ser	Ala	Gly	Glu	Gly	Asp	Val	Arg	Val		
			100					105					110				
Ala	Lys	Val	Leu	Trp	Trp	Tyr	Tyr	Phe	Ser	Lys	Leu	Val	Glu	Phe	Leu		
		115						120					125				
Asp	Thr	Ile	Phe	Phe	Val	Leu	Arg	Lys	Lys	Thr	Asn	Gln	Ile	Thr	Phe		
	130					135						140					
Leu	His	Val	Tyr	His	His	Ala	Ser	Met	Phe	Asn	Ile	Trp	Trp	Cys	Val		
145					150					155					160		
Leu	Asn	Trp	Ile	Pro	Cys	Gly	Gln	Ser	Phe	Phe	Gly	Pro	Thr	Leu	Asn		
				165					170					175			
Ser	Phe	Ile	His	Ile	Leu	Met	Tyr	Ser	Tyr	Tyr	Gly	Leu	Ser	Val	Phe		
			180					185						190			
Pro	Ser	Met	His	Lys	Tyr	Leu	Trp	Trp	Lys	Lys	Tyr	Leu	Thr	Gln	Ala		
		195					200						205				
Gln	Leu	Val	Gln	Phe	Val	Leu	Thr	Ile	Thr	His	Thr	Leu	Ser	Ala	Val		
	210					215					220						
Val	Lys	Pro	Cys	Gly	Phe	Pro	Phe	Gly	Cys	Leu	Ile	Phe	Gln	Ser	Ser		
225					230					235					240		

Tyr Met Met Thr Leu Val Ile Leu Phe Leu Asn Phe Tyr Ile Gln Thr
 245 250 255
 Tyr Arg Lys Lys Pro Val Lys Lys Glu Leu Gln Glu Lys Glu Val Lys
 260 265 270
 Asn Gly Phe Pro Lys Ala His Leu Ile Val Ala Asn Gly Met Thr Asp
 275 280 285
 Lys Lys Ala Gln
 290

<210> 64

<211> 299

<212> PRT

<213> Mus musculus

<400> 64

Met Glu His Phe Asp Ala Ser Leu Ser Thr Tyr Phe Lys Ala Phe Leu
 1 5 10 15
 Gly Pro Arg Asp Thr Arg Val Lys Gly Trp Phe Leu Leu Asp Asn Tyr
 20 25 30
 Ile Pro Thr Phe Val Cys Ser Val Ile Tyr Leu Leu Ile Val Trp Leu
 35 40 45
 Gly Pro Lys Tyr Met Lys Asn Arg Gln Pro Phe Ser Cys Arg Gly Ile
 50 55 60
 Leu Gln Leu Tyr Asn Leu Gly Leu Thr Leu Leu Ser Leu Tyr Met Phe
 65 70 75 80
 Tyr Glu Leu Val Thr Gly Val Trp Glu Gly Lys Tyr Asn Phe Phe Cys
 85 90 95
 Gln Gly Thr Arg Ser Ala Gly Glu Ser Asp Met Lys Ile Ile Arg Val
 100 105 110
 Leu Trp Trp Tyr Tyr Phe Ser Lys Leu Ile Glu Phe Met Asp Thr Phe
 115 120 125
 Phe Phe Ile Leu Arg Lys Asn Asn His Gln Ile Thr Val Leu His Val
 130 135 140
 Tyr His His Ala Thr Met Leu Asn Ile Trp Trp Phe Val Met Asn Trp
 145 150 155 160
 Val Pro Cys Gly His Ser Tyr Phe Gly Ala Thr Leu Asn Ser Phe Ile
 165 170 175
 His Val Leu Met Tyr Ser Tyr Tyr Gly Leu Ser Ser Ile Pro Ser Met
 180 185 190
 Arg Pro Tyr Leu Trp Trp Lys Lys Tyr Ile Thr Gln Gly Gln Leu Val
 195 200 205
 Gln Phe Val Leu Thr Ile Ile Gln Thr Thr Cys Gly Val Phe Trp Pro
 210 215 220
 Cys Ser Phe Pro Leu Gly Trp Leu Phe Phe Gln Ile Gly Tyr Met Ile
 225 230 235 240
 Ser Leu Ile Ala Leu Phe Thr Asn Phe Tyr Ile Gln Thr Tyr Asn Lys
 245 250 255
 Lys Gly Ala Ser Arg Arg Lys Asp His Leu Lys Gly His Gln Asn Gly
 260 265 270
 Ser Val Ala Ala Val Asn Gly His Thr Asn Ser Phe Pro Ser Leu Glu
 275 280 285
 Asn Ser Val Lys Pro Arg Lys Gln Arg Lys Asp
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 1 5 10 15
 Trp Tyr His His Ile Thr Val Leu Leu Tyr Ser Trp
 20 25